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Tros Tyriusque mihi nullo discrimine agetur.

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NORTH AMERICAN REVIEW.

No. CCLXX.

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I.

OUR ELECTION LAWS.

A GOVERNMENT based upon popular suffrage can be successful in the best sense only to the extent that the popular voice is freely expressed, fairly and honestly ascertained, and fully obeyed. It is therefore of the greatest consequence that the purity and sanctity of the ballot should be guarded by the wisest and best legislation that statesmanship can devise. It is impossible to over-estimate the importance of this subject in a government such as ours, where the supreme power is vested only in the people, to be exercised by means of the ballot. Fairness and honesty in the conduct of elections will alone keep pure the sources of power in this Government, and thus promote peace and good order, and give stability to our institutions. Our election laws ought to be framed and executed with a view to securing these great ends, but truth compels the statement that our statutes are exceedingly imperfect in themselves, and, what is worse, are too often administered in the interest, not of purity and justice, but of party. It is not to be denied that many of the wisest and best of our citizens consider that our institutions are in peril from the fact that popular elections are so frequently controlled by fraud and violence. Wise and prudent citizens may well say that, if we lose faith in the machinery provided for the expression of the popular will, we must also eventually lose faith in

our form of free government, since it can be valuable only in proportion as it is in fact, as well as in theory, a government by the people. As our population increases and our great cities multiply, the problem of how to secure and preserve freedom and fairness in elections grows annually more grave and difficult. It is to-day a question of how to secure and record a fair and honest expression from nearly nine millions of voters. Within the lifetime of some of the present generation it will become a question of dealing with at least thirty millions of voters. To be assured that this problem has been solved is to know that our greatest danger has been removed, and therefore every citizen should be willing to contribute something toward its solution. These considerations have induced me to undertake the task of submitting, for the consideration of the readers of "The North American Review," a statement of some defects in our election laws, and of suggesting the remedies. Let me premise that the ends to be aimed at by legislation upon this subject are (1), to secure to all legal voters equal and ample opportunity to vote, and to exclude all others; and (2), to secure a fair canvass and an honest declaration of the result of every election. No difference of opinion can exist among honest men as to the propriety, nay, the necessity of securing these ends, which all will admit constitute the foundation upon which the fabric of free government rests. To render them secure, is to perpetuate our institutions and transmit them pure and strong to future generations. It would seem that no State should hesitate to provide the legislation necessary to secure ends so manifestly just, and so essential to the very existence of free government, and yet great frauds are annually perpetrated. Many of the laws upon this subject were originally enacted for the government of a largely rural and agricultural population, who needed few if any restraints, and they have been copied and applied to communities very differently situated from such a population, and, as a whole, by no means so well disposed toward law and order. Assuming that the ends to be sought are freedom and equality among voters, and honesty and perfect fairness in the count, and that these great ends are not always secured under existing laws, let us inquire how we may remedy existing evils by legislation. I maintain that plain, simple, and ample remedies are within our reach, the adoption of which would injure none, while, as nearly as human laws can do so, they would protect the rights of all.

First in importance as a means of securing freedom in elections,

are such statutory provisions as will prevent the crowding of the polling-places by large numbers of people. In some of the States all the voters of an entire county may vote at the county seat, and in all the large cities and in many of the smaller ones the crowds that assemble at the polls are large and often disorderly and turbulent. The evils that result from overcrowding the polling-places are apparent enough :

1. It delays the process of voting so that each voter waiting for his turn may be detained for hours. Many business men, who value time more highly than the right of suffrage, are deterred from voting by this consideration alone.

2. It makes it a difficult and disagreeable task for quiet, orderly people, and especially for the sick, lame, and infirm, to press their way through the throng, and many of these are thereby deterred from voting.

3. It makes it impossible to consider with deliberation and decide intelligently questions arising at the polls as to the qualifications of persons whose votes are challenged, and this leads to erroneous rulings. But, what is worse, it affords evil-minded persons the opportunity, by frequent challenges and by unnecessary discussion, to so delay the proceedings as to consume the day and exclude large numbers of legal voters, who by these interruptions are prevented from reaching the polls within the time required.

4. The practice of crowding the polls by the members of one party, who open the way for their friends and put all possible obstacles in the way of their opponents, is frequently resorted to as a means of defeating a full and fair vote.

All these mischiefs can be remedied by requiring a

Multiplication of Voting Precincts,

to such an extent that only a limited number of voters—say, not over five hundred—shall be residents of and voters in any one precinct. This, with a further provision requiring every voter to register and vote in his own precinct and in no other, would, if adopted in all the States, work a reform of vast importance and consequence. This very important subject of legislation is by no means the most difficult one with which our law-makers have to deal. The task of providing against the most crying evils of our system of election laws should be approached with the conviction that the people can well afford to be put to some pains and expense in order to protect the purity of the ballot, and, if thus approached, the problem will be

found very easy of solution. The multiplication of voting precincts will prove an effectual remedy for all the evils which result from overcrowding the polling-places, some of which are specified above. A properly guarded statute upon this subject would secure, as a rule, sufficient time and opportunity at each poll for the orderly, deliberate, and satisfactory transaction of the business of receiving and depositing the ballots of all legal voters, and for the examination and decision of disputed questions arising at the election. Let us suppose that a population containing five hundred voters be the basis upon which election precincts are to be organized, who does not see that, with only that number of votes to be received in the course of the day, the election could be conducted decently and in order? Contrast such an election with the attempt in a great city to receive the ballots of many thousands of voters, and pass upon hundreds of challenges!

In connection with the increase of the number and reduction of the size of precincts there should be provided a

Complete Registration,

and by this I mean an enumeration of the legal voters of each precinct, made with the utmost possible care. By requiring that each precinct shall be small in the sense of containing only a limited number of voters, and by appointing a board of registration for each precinct, it will be practicable and easy to enroll every voter. This process is especially necessary in the city precincts, and its application only to them would probably be entirely sufficient. If the precinct is not too large in the country, the judge of the election or the bystanders will be able to recognize the voters, with rare exceptions. But in the cities, where the registry must be relied on, provisions should be made to render it accurate, and none but registered voters should be allowed to vote. The persons preparing the list should be required, if necessary, to go from house to house, and by all reasonable means to make sure that no legal voter is omitted, and the voters themselves should be made to know that they must register if they wish to enjoy the franchise. Whoever neglects to enroll himself as a voter, can not complain that he is not allowed to vote. The registry list should be printed or written, and posted up at the most public places in the precinct at least ten days prior to the day of election, and corrections and additions should be made up to the day before the election. With these two requirements, namely, small precincts and complete registration, how easy becomes the

task of receiving and depositing in the box the ballots of all who are entitled to vote! There can be no objection to these provisions, except that they propose a multiplication of election officers, and some additional labor and expense. To this objection I reply that the end is so important that, in comparison with it, the trouble and expenses made necessary to secure it are not worthy of a moment's attention. If, however, the *cost* must be considered, it may be suggested that by having fewer elections a corresponding saving would be made. Let our officials be chosen for longer terms. This would save much in the way of expense, and at the same time benefit the people by relieving them from the continual excitement and agitation caused by the struggle of parties for office and power. Another great advantage would result from the adoption of small precincts. The voters would be very generally known to each other, and in no single precinct would it be possible for any considerable number of non-residents, or otherwise disqualified persons, to cast fraudulent votes without detection. Nor would it be possible for fraudulent voters to personate absent or deceased persons. In a precinct composed of only a small number of voters, generally known to each other, such frauds would be impossible.

It may be said that some of the worst frauds are committed with the assistance or connivance of the officers of election, and that therefore fraud in the election or in the count would be possible, notwithstanding the reduction of the size of precincts. This is very true, and the suggestion brings me to the next essential of an efficient election law, which is such provision as will prevent the selection of purely

Partisan Election Boards.

All parties in interest should be represented in each board of election officers, and by witnesses to be present. The officers of the election should be required to perform all their official duties in the presence of each other and in the presence of a limited number of witnesses representing the several parties to the contest. No considerable fraud can be committed by an election officer without the knowledge of all the members of the board; and therefore great security is to be found in a statute requiring all sides to be represented upon such boards. Add to this a provision requiring the admission to the room where the ballots are received, deposited, and counted, of at least one witness on behalf of each party interested, and great frauds with the knowledge or connivance of the board will become practically impossible. The witnesses should

not be clothed with authority to interfere (otherwise than as any citizen might through the proper judicial proceedings) with the action of the officers, but should be permitted to witness every step in the progress of the election and the count, and to verify the correctness of the same. Officers of the law who propose to do their duty, and nothing more nor less, can not reasonably object to the presence of witnesses representing the parties most interested, and officers who are capable of a violation of duty should not be permitted to object. It is a safe and sound principle, and one which ought to be applied in the preparation of election laws, that men are not apt to commit crime in the presence of witnesses. Let the law be so framed that every step, from the opening of the polls to the completion of the count and the announcement of the result, shall be taken in the presence of at least two intelligent witnesses representing opposing candidates, and the chances of successful fraud will be reduced to the minimum.

There is another mode of cheating which demands attention, and should be guarded against by legislation, and that is by

Tampering with the Ballots

after they are cast and before they are counted. This is generally done after the polls are closed. If the law permits, the board is apt to adjourn and its members to separate, for a time, during which a strict and honest watch over the ballot-box is not always kept. The only remedy is to require the votes to be counted immediately after the closing of the polls, and to strictly forbid the separation or adjournment of the board until the count is completed and the return signed.

It is of the utmost importance that the statutes of every State should imperatively require an

Immediate Canvass

by officers and before witnesses representing both sides.

What would the people of this country say to a proposition that Congress and our State Legislatures should sit with closed doors, excluding all witnesses from their presence, or that courts and juries should try causes in secret? The suggestion would, of course, meet with a storm of dissent and denunciation from all parts of the land. With equal, if not greater reason, may the people demand the utmost publicity in the proceedings of a popular election, whereby Congresses and Legislatures are made and unmade.

Legislation upon this subject should not be based upon the theory that officers of election will always do right. If that were the fact, no penal election laws would be necessary. On the contrary, the law should, if possible, be so framed that an election officer shall not, if he would, defraud the electors without exposure and punishment. In this connection is further seen the importance of the first-named essential of an efficient election law, namely, small voting precincts; for, if the number of ballots to be counted does not exceed five hundred, the time required for the canvass will not be great, and the work can be conveniently done without an adjournment or separation of the board.

It is scarcely necessary to say that no statute regulating elections can be complete without containing ample provision for the prevention of every species of

Intimidation

of voters, whether by violence, the exhibition of force, threats, or other means. In a well-ordered community this crime will be rarely committed, and in every such community public opinion will demand its prompt and severe punishment. The law should be so framed as to guard with scrupulous care the perfect freedom of the ballot, and every attempt to rob even the poorest and weakest elector of his free choice should be regarded as a high crime, since the rights of all are involved in the question of the protection of the rights of each.

Another mode of cheating at elections is that known as the

Tissue-ballot Fraud

and other kindred contrivances, by means of which one person may deposit in the box a number of ballots. For this a plain, simple, and effectual remedy will be found in the enactment of a law prohibiting altogether the employment of such ballots, and forbidding the election board to count them if cast. This can be accomplished either by fixing the size of the tickets to be used, or by requiring the voter to place his ballot in an envelope containing nothing else, and hand it thus to the officer authorized to receive it.

From what has now been said it will be seen that, in my judgment, every efficient election law must among other things provide:

1. For small voting precincts.
2. That an elector shall vote only in the precinct of his residence.

3. For complete registration, especially in cities, and only persons registered to be allowed to vote.

4. For representation of all parties on boards of election and registration.

5. For the presence with the officers of election, at all stages of the proceedings, of witnesses representing the parties in interest.

6. For a canvass of the vote immediately upon the close of the polls, and without an adjournment or separation of the board.

7. For the punishment of violence and intimidation.

8. For the prohibition of the use of tissue ballots and kindred fraudulent contrivances.

These, in addition to the ordinary directory provisions, are essential. Experience will doubtless show the necessity for other and further enactments.

I conclude this article with a reference to and a few reflections upon existing election laws, State and national, in order to show how far they are deficient if judged by these requirements.

In most of the States the statutory provisions regulating the formation and fixing the extent of election precincts are exceedingly imperfect. In probably a majority of cases the subject is committed absolutely to certain county officers—as, for example, in Alabama, Colorado, Florida, and Nebraska, to the county commissioners; in Arkansas and California, to the county supervisors; in North Carolina, to the board of justices of the peace; and in Tennessee, Texas, and West Virginia, to the county court. In at least twenty-four States neither the number nor size of precincts is fixed by law. In several States, towns or townships in the country and wards in the cities are constituted election precincts, which is a very excellent arrangement so far as the rural districts are concerned, but often works very badly in cities where the wards are generally altogether too large and populous for convenient election precincts. In two States only (New York and Oregon) do we find such legislation on this point as seems to be required. In Oregon it is provided that election precincts shall not contain more than three hundred voters, and in New York the maximum in cities is eight hundred voters. In those States where the matter is confided to local officers (and they include a great majority of the States) there is great temptation to partiality and injustice in the designation of precincts and of voting-places. Purely partisan considerations too often control the action of the local authorities.

In some instances it would seem that polling-places have been

arranged with a view to render it very inconvenient if not impossible for large numbers of electors to cast their votes.

All the States, except Indiana, Georgia, Kansas, Oregon, Tennessee, and West Virginia, have registry laws. Very few of them, however, contain provisions limiting the right of voting to registered electors, and for making the registry perfect and complete in advance of the day of voting. These, as we have seen, are very necessary provisions. Any statute that leaves open the question of the right of non-registered persons to vote, and devolves the duty of deciding in each case upon the election board, on election day, will prove a frail barrier against fraud. Let the registry list be prepared with the most pains-taking care by a board of registration composed of persons belonging to the different political parties, and let all persons not registered be excluded from the privilege of voting.

As to the place of voting, some of the States still continue the vicious practice of permitting an elector to vote anywhere in the county of his residence. Such seems to be the law in Arkansas, California, Georgia, Kentucky, and Oregon. It is, however, gratifying to be able to state that the tendency of legislation is very strongly toward the sound and salutary doctrine that each elector should be required to vote in the neighborhood of his residence, and where he is likely to be known to election officers and bystanders.

Several of the States have recognized the importance of providing for the presence with the election officers of witnesses representing the parties to the contest—a most important step in the right direction, and one which every State should adopt. For example, the law of Alabama provides for the presence of five of each party ; that of Florida provides for the presence of one representative of each political party that has nominated candidates ; that of Illinois, for the presence of two legal voters of each party to the contest ; those of Kansas and Oregon permit the presence of the candidates in person, or of not exceeding three of their friends. Similar statutes are also to be found in Pennsylvania and Virginia.

The very important requirement that the board of election officers should be composed of members of different political parties is omitted from the statutes of twenty-two States. Comment upon this fact is quite unnecessary.

The still more necessary requirement that there shall be a count of the votes immediately upon the close of the polls is, I am glad to say, to be found in the statutes of nearly all the States. A few, however, have omitted it. Thus, in Mississippi, if the canvass is not

finished by 12 P. M., it may be completed the next day. And in South Carolina it is provided that the board of managers may have three days in which to deliver to the commissioners of election the poll-list and the boxes containing the ballots, and that the commissioners of election shall meet *at the county seat* on the Tuesday next after the election and proceed to count the votes of the county. In this State there is no law providing for the count of the precinct vote at the place of voting, but both boxes and ballots are to be carried to the county seat and there canvassed by a board of commissioners nearly a week after the close of the polls. This statute reads as if it might have been framed with a view to provide ample opportunity for tampering with the ballots between the day of election and the day of counting.

The form and size of the ballot are regulated by law in but few of the States. In twenty-two States no law is found upon the subject. In several others it is provided that all ballots shall be printed or written on plain white paper. In California they are required to be four inches in width and twelve inches in length, and there is a similar statute in Nevada. Except in these two States there is no law to forbid the use of a ballot printed in the finest possible type, and on the smallest possible piece of paper. It is well known that the absence of this regulation has given rise to some very gross frauds in recent years.

Congressional Legislation.

This article would not be complete without some remarks upon the jurisdiction of the State and National Governments respectively over the general subject of elections, and a brief reference to Congressional legislation with reference thereto.

The Fifteenth Amendment to the Constitution of the United States prohibits any abridgment by the United States, or by any State, of the right of citizens to vote, on account of race, color, or previous condition of servitude, and gives Congress power to enforce this provision by appropriate legislation. Subject to this limitation, the States respectively possess the exclusive power to prescribe the times, places, and manner of holding all elections, except those for Representatives in Congress, which latter they may also regulate, subject to the paramount authority of Congress. That the power of Congress over the manner of electing its own members is absolute and plenary, will be seen by reference to the provisions of Article I., section 4, of the Constitution, which provides as follows:

The times, places, and manner of holding elections for Senators and Representatives shall be prescribed in each State by the Legislature thereof; but the Congress may at any time by law make or alter such regulations, except as to the places of choosing Senators.

Under this very comprehensive provision Congress, if satisfied with existing State regulations, may abstain from exercising its authority; but, if Congress shall deem the State laws upon the subject insufficient, it may at pleasure "alter" them. In like manner, Congress may set aside all State regulations and "make" new and complete rules of its own to govern Congressional elections. The power given to Congress is to make regulations concerning the *manner* of holding such elections—a very broad and comprehensive power. It clearly includes authority to provide all the necessary machinery for conducting the election as well as to provide suitable laws for the punishment of frauds against the freedom and purity thereof.

Acting upon this doctrine, Congress has from time to time dealt with the subject, and the principal part of its legislation upon it is embodied in sections 2,011 to 2,031, inclusive, of the Revised Statutes of the United States. The most material features of this legislation are the following:

1. Upon petition of citizens stating that they desire to have the registration or election in a particular place "guarded and scrutinized," the United States Circuit Court appoints two resident citizens "who shall be of different political parties, and able to read and write the English language, and who shall be known and designated as supervisors of election."

2. These supervisors are authorized and required to attend at the registration or election, with power to challenge any person offering to register or vote. They have the right to examine the registry list, and to make a copy of it. They have the right to be present during the voting, and also during the counting of the votes, and to be wherever the ballot-boxes are kept, from the opening of the polls until the count is completed and the returns made and certified.

3. The supervisors are also authorized to personally scrutinize, count, and canvass the votes cast for Representatives or delegates in Congress, and to make a certificate or return of the same to the chief supervisor.

4. If the supervisors are interfered with, or prevented from discharging their duties under the law, they are required to report the

fact to the chief supervisor, who is to make a thorough investigation, examining witnesses under oath, and report all the facts to the House of Representatives.

5. In cities of twenty thousand inhabitants, or more, the United States marshal is authorized, upon application, to appoint special deputy marshals to aid and assist the supervisors to verify the registry list and poll list, and to keep the peace, and support and protect the supervisors in the discharge of their duties. They are also to prevent fraudulent registration and fraudulent voting, and may arrest, with or without process, and either before or after voting, any person who commits or attempts to commit any of the offenses prohibited by the act, or any offense against the laws of the United States; but no person shall be arrested without process except for an offense committed in the presence of the marshal or some one of his deputies, or a supervisor of election; and any person arrested is to have a hearing forthwith.

6. One chief supervisor for each judicial district is to be appointed by the circuit judge from among the Circuit Court commissioners. He is to furnish all necessary books, forms, and blanks for the use of the supervisors, and have a general supervision over them.

7. Supervisors of election, appointed in counties or parishes outside of cities of more than twenty thousand inhabitants, have no power to make arrests or to perform other duties than to be in the immediate presence of the officers holding the election, and to witness all their proceedings, including the counting of the votes and the making of a return thereof.

These embrace in brief the substance of the national election law. That legislation by Congress upon the subject was both proper and necessary is shown, not only by the history of Congressional elections, but also by reference to the manifest defects in State legislation already pointed out. Until it can be made to appear that the States have provided all necessary guards for the protection of the purity of Congressional elections, it will remain the imperative duty of the United States Government to supply the omission.

The framers of the Constitution understood perfectly well that to contribute by fraud or other unlawful means to the defeat of the will of the majority of legal voters at a Congressional election is a wrong against every citizen of the Union, and a crime against the whole nation, and hence the power in question was reserved to the

National Legislature. It is a power which Congress ought to exercise with justice and wisdom. The national statutes upon this subject should be perfectly just, fair, and non-partisan, but they should also be made thoroughly efficient.

The true friends and advocates of honesty and purity in elections will endorse and applaud an effort to so amend these laws as to improve them and increase their efficiency, but all attempts to weaken or destroy them will meet with emphatic condemnation.

GEORGE W. MCCRARY.

II.

CAMPAIGN NOTES IN TURKEY—1877-'78.*

THE campaign naturally divides itself into three periods:

1. From the crossing of the Pruth to the passage of the Danube, April 24 to June 27, 1877.

2. From the passage of the Danube to the fall of Plevna, June 28 to December 10, 1877.

3. From the fall of Plevna to the signature of the armistice at Adrianople, December 11 to January 31, 1878.

Each of these periods has its own characteristics.

FIRST PERIOD.

The mobilization of six army corps, each to consist of twenty-four battalions of one thousand men, eighteen squadrons of one hundred and fifty men, and twelve batteries of eight guns, was ordered on November 13, 1876, and completed on the 27th. Two corps were scattered along the Black Sea coast, and the other four concentrated about Kischineff, in Bessarabia, fifty miles from the Pruth. Subsequently nine more army corps were ordered to be mobilized, but of these only three were destined for the "Army of the South," under command of the Grand Duke Nicholas. It was therefore contemplated to invade Turkey with seven army corps, or a maximum of two hundred and ten thousand men, which, by the usual sickness at the beginning of a campaign, details for special duty,

* The following article, as far as page 475, is in substance a reproduction of an official report, dated March 31, 1878, which I sent to the Government from San Stefano, where I was at that time attached to the Russian headquarters in the capacity of military *attaché* of the United States, having been sent abroad for the purpose of observing the war, and having been constantly with the Russian troops since the previous month of August. It is published with the permission of the War Department.

guards, etc., would be reduced to one hundred and eighty thousand before a single shot could be fired. The Turks subsequently put two hundred and fifty thousand effectives in the field in Europe; and it was this terrible mistake of under-estimating the strength of their opponents which, more than any other cause, contributed to bring about the reverses and checks which Russia sustained after crossing the Danube.

War was declared on the 24th of April, and, crossing the Pruth at three points on the same date, the Grand Duke pushed his army forward through Roumania; four corps to and beyond Bucharest, two corps following them in reserve, and one corps crossing into the Dobrudja. Moltke says, in his "History of the Campaign of 1829," that the Dobrudja would be the line of future Russian invasions, but the circumstances upon which this opinion was based were wholly revolutionized when the Russians lost control of the Black Sea in 1856. It still, however, furnished a ready outlet for an attack upon the Russian communications, and, in order to forestall this, it was at once occupied by one army corps.

The bulk of the army traversed Roumania, a distance of nearly four hundred miles by the roads, in forty days, and concentrated on the Danube opposite Nikopolis in the early days of June. There was but one line of railroad, and that one a single track, with insufficient terminal facilities, and of different gauge from the Russian railroads; it was used principally to transport material, the greater part of the troops marching by road. The spring was an unusually wet one, the roads were flooded, bridges carried away, etc.; so that, all difficulties considered, this march was as rapid as could be expected. Arrived in front of the Danube, a further delay was occasioned in constructing and transporting boats and rafts for the passage. But finally, after demonstrating at Nikopolis, the river was passed at Sistova on the 27th of June, in a very brilliant manner, and with a loss of only eight hundred men.

Second Period.

Relying upon the traditional Turkish mode of warfare for the past two centuries, i. e., the defensive behind fortifications of some sort, the Russian staff had formed the following plan of campaign, viz.: to post strong bodies of men on the lines of the Jantra and Vid, and to advance as between two walls over the Balkans to Adrianople. Accordingly, Gourko was immediately sent forward with an advance guard of ten thousand men of all arms, to seize

and hold a passage in the Balkans; two corps were sent to the left flank (line of the Jantra), one corps to follow Gourko, one corps to the right flank (line of the Vid), and two corps in reserve to be used according to circumstances.

The line of the Jantra was secured without much difficulty.

The passage in the Balkans was secured by Gourko in a most brilliant manner; the history of his movements from July 7th, when he left the Danube, to the capture of the Shipka Pass on July 17th, as well as his subsequent retreat before the vastly superior forces of Suleiman Pasha, forms a model example of an expedition of this kind.

On the right flank, the Ninth Corps, under Krudener, captured the fortress of Nikopolis with all its garrison on the 16th of July, and then immediately turned toward Plevna to secure the line of the Vid. But the advance guard arrived a few days after that of Osman Pasha, who was coming from Widdin, and it was badly beaten in the streets of the town on the 20th. The rest of the corps was then brought to Plevna, and, assisted by parts of the Eleventh Corps, on July 30th it attacked such fortifications as the Turks had meanwhile constructed outside the town. It was disastrously repulsed with great loss.

To attempt to continue the advance while Osman's army remained at Plevna was impossible; yet, not enough troops could be concentrated to crush Osman without abandoning Shipka and the Jantra, against which course there were strong political reasons, viz., the fear that the Bulgarians north of the Balkans would be massacred, as so many of those on its southern slope had been after Gourko's retreat. It was then realized what a mistake had been made in under-estimating the strength of the Turks; and the Guards, the Grenadiers, and five divisions of the Line (one hundred and forty-five battalions in all) were ordered to the Danube, and one hundred and eighty-eight thousand men of the reserve were called out to replace the losses already sustained and to be ready to supply those of the future; and, as some time must elapse before these reënforcements could arrive, an appeal was made to Roumania for her army of thirty-five thousand men which was ready to cross the Danube.

For the next four months the whole campaign turned on the capture of Plevna, the troops on the left flank and at Shipka simply remaining on the defensive, sustaining most violent though ill-concerted attacks of the Turks, against which they succeeded in holding their ground, though with great losses.

By the 1st of September the Roumanians and two Russian divisions having arrived, and there being no prospect of more reënforcements for some weeks, another move was made on Plevna, where meanwhile the Turks had not only received reënforcements, but had worked incessantly upon their fortifications. The assaults were made on the 11th of September and resulted in a terrible repulse and the loss of eighteen thousand men. Having failed in three assaults upon Plevna, and having lost nearly thirty thousand men therein, the Russians now determined to sit down in front of it, to fortify their own positions, and then gradually to begin extending their right and left flanks so as to complete the investment. The Commander-in-chief having, with the Emperor's approval, determined to begin a siege of Plevna, General Todleben, the hero of Sevastopol, was summoned from St. Petersburg as the most competent engineer to direct the siege. With the arrival of the Guard in October, the redoubts in Osman's rear were carried, and a circle of investment was tightly formed. The place was finally starved out, and, after a vigorous sortie on the 10th of December, its whole garrison surrendered.

Third Period.

From the Fall of Plevna to the Armistice at Adrianople.—After Plevna had been invested in October, there were more troops in its vicinity than were absolutely necessary to hold the line of investment. A portion of the Guard had therefore been sent, under Gourko, toward the Balkans on the Sofia road, to oppose any force that might come to its relief. By a series of well-planned movements and hard marching, Gourko, with very slight loss, had manœuvred the Turks out of all their positions in the foot-hills, and had established himself in front of their main position on the crest of the mountains.

The fall of Plevna, therefore, found the troops on the left flank and at Shipka substantially in the same positions as during the summer, Gourko in front of the Turks on the mountains near Sofia, and seventy thousand men (Russians) disposable at Plevna. Winter had just set in, the roads were wellnigh impassable, the bridges across the Danube were sure soon to break with the ice, and there was not a great supply of provisions south of the Danube. The Turks had fifty thousand men in the quadrilateral, thirty thousand at Shipka, twenty-five thousand at Sofia, and a reserve whose numbers are not accurately known at Constantinople. If the Russians advanced,

military principles led one to suppose that the Turks would leave thirty thousand men in the quadrilateral, fifteen thousand each near Sofia and Shipka to oppose the advance as much as possible, and put fifty thousand men into the extensive fortifications of Adrianople—withdrawing to the same point their own supplies and as much as possible of those of the country. The Russians would arrive there in the dead of winter, with a line of communications almost if not quite untenable, over a high range of mountains, and Plevna could be repeated under circumstances tenfold more difficult for the Russians. The prudent military course was therefore advised, by a certain portion of the Grand Duke's staff, including General Todleben, viz., to put the troops in winter quarters at the northern base of the Balkans on the few chaussées, and to begin an energetic siege of Rustchuk. But various political considerations of the very highest importance (viz., to give the Turks no time to recuperate, and to prevent the war from falling into the hands of diplomacy and probable foreign intervention) induced the Grand Duke to resolve to carry on the advance at all costs, and in spite of all the difficulties of the season and of the topography. The force about Plevna was therefore distributed to Gourko at Orkhanie and to Radetzky at Shipka, and orders were given to advance at once. The Turks then hastily withdrew twenty thousand men from the quadrilateral, but, instead of posting them at Adrianople, sent them toward Sofia, where they shared the fate of those they came to assist.

Gourko passed the Balkans near Sofia in the last week in December, and, though owing to the depth of the snow he failed to capture the army in front of him, he pursued it with the utmost energy, and finally captured all its artillery near Philippopolis on the 17th of January, and completely routed and dispersed it over the Rhodope Mountains toward the Ægean.

Radetzky crossed the Balkans on both sides of the Shipka Pass during the first week in January, and, after a brilliant assault by Skobeleff at Cenovo on the 9th, he bagged the entire Turkish force of thirty-six thousand men.

The whole Turkish defense, therefore, went down with a crash, and at the end of January they signed an armistice, surrendering the Danube side of the quadrilateral of fortresses, and all the defenses of Constantinople, and allowing the Russians to advance to the gates of that city, and to revictual their army through the ports on the Black Sea. The Grand Duke's resolution had attained the success to which its boldness entitled it.

I have thus indicated in outline the main features of the campaign in Europe, on which, in spite of the capture of Kars and other successes in Asia, the whole war depended. It only remains to state a few of the more prominent impressions which were acquired by personal observation of the campaign. The fighting material of both armies was excellent. Both the Russian and Turkish soldiers showed the highest bravery, patience, and obedience, and on the part of the Russians a stolid indifference to temporary disasters, and to hardships such as few wars offer. The Turkish regimental and company officers were ignorant and almost worthless, having the same bravery as their men, but being in no way superior to them. The Russian officers of the same grade were well instructed in their professional routine duties, but outside of the Guard they were somewhat lacking in intelligence and general education, as compared with the standard in our own service.

In armament the Turks had a slight superiority. Their steel breech-loading artillery from Krupp's factory is unsurpassed for lightness and accuracy, though its efficiency was greatly diminished by lack of reserve draught-horses (of which Turkey furnishes hardly any), and by the failure to provide a sufficient quantity of shrapnel. In small-arms the great body of their troops had the Peabody-Martini (made by the Providence Tool Company of Rhode Island), a most admirable weapon; and the Snider, which a few of their troops had, is a very serviceable arm, far superior to the Krenk gun of the Russians.

The Russian artillery, bronze breech-loaders, was heavier than that of the Turks for similar calibers, and the metal of many pieces was ruined by rapid firing; it is now being replaced as rapidly as possible by the Krupp system.

The Guards, Grenadiers, Rifle Brigades, and two or three divisions of the line of the Russian army were armed with the Berdan rifle. Like the Peabody-Martini it has a small caliber (·42″) elongated bullet (1·07″, weight 372 grains), heavy charge (78 grains) and flat trajectory, and it carries with deadly effect to eighteen hundred yards. Although its breech mechanism is somewhat complicated, there were no complaints of its getting out of order. Almost all the troops of the line were armed with the Krenk gun, a converted breech-loader. This is now quite an antiquated weapon, owing to its large caliber (60″), short, heavy bullet, and small range. Its extractor was fatally defective, and many a man lost his life from its failing to act.

In equipment the Turks had no regular transport service at all; and it is possibly due in a large measure to this fact that they failed to follow up their victories at Plevna, July 30th, and on the Lom in September. In either case a well-equipped army, energetically led, would certainly have destroyed the Danube bridge and placed the Russian army in a very critical position. The Turks accumulated their stores in large depots, and then distributed them by ox-carts, raised by requisition in the surrounding country, and they used the same means, with the addition of a few pack-horses, to transport their provisions and camp equipage on the march. Rapid movements in advance were therefore impossible, and in retreat only by the abandonment of great quantities of supplies. Gourko's column alone captured during the winter over eight thousand tons of rations, and about ten million rounds of musket-cartridges. Nor had the Turks any hospital department worthy the name.

In both these respects the Russians were very well equipped.

The Russians had the ordinary linen shelter tent, each soldier carrying one piece and one stick. The Turks had a conical tent with cylindrical wall eighteen inches high, and heavy pole; it accommodated ten men. This cumbrous affair also impeded their movements, and thousands of them were abandoned in their retreats.

The use of field signals was very limited on both sides. The Russians began the campaign with a fine equipment of telegraph parks, containing in all over four hundred miles of wire and its appurtenances; but it was used to connect the headquarters of the various widely scattered parts of the army, and in Bulgaria it was never put up on the field during an action. When winter came on not enough care was taken to prevent the men from burning the telegraph poles of the old established lines for camp-fires, and therefore the field wire had to be used on the high-road; there was naturally not enough for this purpose, and consequently Gourko's most active operations in January took place beyond the reach of the telegraph, which only reached the northern slope of the Balkans. On the other hand, the battle of Aladja Dagh, which decided the campaign in Armenia, owed the greater part, if not the whole of its success, to a field wire, about forty-five miles long, which was put up by General Lazareff's column while he passed completely around the flank of the Turks, and came up on their rear, remaining always in constant communication with the Grand Duke Michael and the bulk of the Russian forces in the Turkish

front. A simultaneous attack from both sides destroyed Mouktar Pasha's field army.

The Turks employed the telegraph constantly, but in the form of a heavy wire put up on solid poles by the aid of forced labor of the peasants. All the batteries of their intrenched camps were invariably connected by a wire. But they had no portable field parks, and of course the whole telegraph line was abandoned in their retreats.

Of signaling by flags or other similar means, no use was made, and its importance seems hardly to have been appreciated.

I remember, the morning after the principal assault of Plevna (September 11th), sitting with the deputy chief of staff near the Grivitza redoubt, which had been taken the previous day, and watching through our glasses for over an hour the fight which was still going on between Skobeleff on the left flank and the Turks opposed to him. It was a bright, clear morning, but, although we could distinguish individual men here and there, yet in the smoke and our ignorance of the ground we could not recognize which line was Turks and which Russians, and the chief of staff was in complete ignorance of what was going on in sight of him. The distance in a straight line over the heads of the Turks was six and a quarter miles; by the roads in rear of the Russian lines which couriers had to follow it was about twelve miles. Several couriers were at that moment on the road, but they did not arrive till afternoon, and then Skobeleff had been driven out. Had he been in constant communication with the Grand Duke's headquarters, either by wire or flags, though he probably would not have been able to hold the redoubts, he might have received his orders to retire in time to save fifteen hundred or two thousand out of the eight thousand men which he lost.

There were many other instances almost as prominent where field signals would have been of the greatest utility.

In tactics, the whole campaign consisted of the attack and defense of field fortifications. The limits of this article are not sufficient to enter upon any extended discussion of this most important subject. I can only here note the increased relative importance of the infantry arm of the service. The Peabody-Martini and Berdan rifles are as superior to the Chassepot and needle-gun of 1870 as were these latter to the Springfield muzzle-loader of 1863. Armed with these latest breech-loaders, the infantry is now *more than ever* the arm of the service upon which all the hard fighting

devolves, which inflicts the greatest damage, and to which all other parts of an army are merely subsidiary.

A simple illustration will make this clear: Four hundred men, garrisoning a little redoubt of one hundred yards on a side, and firing both from the parapet and from the ditch, can now, in twelve minutes, easily deliver twenty-four thousand shots—a veritable hail of lead—each pellet of which, if it strikes a vital part, is fatal *up to a distance of a mile and a quarter;* and, if but one in twenty of these bullets finds its billet, the defenders will have destroyed twelve hundred men during the time that the assailants are passing over this mile and a quarter, i. e., three times their own number; whereas, in 1863, the same number of men, in the same position, would have been armed with a gun which could only be fired, at most, twice in three minutes, and which carried but a third of a mile. This the assailants could have crossed in three minutes, and during this time the four hundred defenders could have delivered but eighteen hundred shots; and if one in twenty of these hit, they would have accomplished a loss among the enemy of only ninety men—less than one twelfth of the destruction possible in 1877. While, therefore, we need not conclude that the attack of a field fortification is now twelve times as dangerous as it was during our civil war (and in fact such numerical comparisons have little real value), yet the above illustration is sufficient to call attention to the great fact of modern tactics, viz., that *in the last few years the defense has gained enormously upon the attack*, owing to the improvements in small-arms; or, in other words, that any attacking force is now at a very much greater disadvantage than it was fifteen years ago.

Reasoning upon these unquestioned facts (which were very fully brought out in the able and accurate correspondence of the London "News" and "Times" during the war), many European writers, as well as a number of Russian officers who were present at Plevna and other assaults, have laid it down as an established principle of modern warfare that field fortifications defended by breech-loaders can not be carried in open assault. Of this sweeping assertion it can only be said that it is hasty and at least unproved. For, although the Russians were twice defeated in their assaults at Plevna, and each time with fearful losses, yet the cause of these defeats lay not so much in the inherent strength of the works as in the fact that the assailants were not numerically sufficient for their task, and that they did not direct their attacks upon commanding key-points, nor

conduct them with proper *ensemble;* while, on the other hand, at Lovtcha, Cenovo, and Kars, where their assaults were directed with the requisite skill and energy, they were in each case brilliantly successful.

As for cavalry, the Turks had barely enough for ordinary outpost service; and the regular cavalry of the Russians, although numerous (one tenth of the infantry) and well mounted and armed, was never energetically led except that which formed part of Gourko's first expedition over the Balkans. It was always kept very near the infantry, seldom passing a night out of support of it, and never attempting any of those independent movements known as "American raids," and which are greatly admired by the Russian staff professors. There were fine opportunities for such expeditions against the Varna-Rustchuk Railroad and throughout the whole month of August against the Plevna-Sofia road, but they were not taken advantage of. When, after the disastrous assaults of the 11th of September, the cavalry was collected and sent behind Plevna to intercept the supply-trains, the general in command manœuvred in such a way as to let all the trains slip through his fingers, being *afraid that he would be cut off from his base*—this, with twenty fresh regiments of cavalry in a country teeming with grain and hay! In the battles on the Lom, in September, there were several instances of hand-to-hand cavalry-fights, usually resulting in favor of the Russians by reason of their long lances. But these affairs never engaged more than one regiment at a time; they had but little influence on the battles of which they formed a part, and none whatever upon the general result of the campaign. Although the Russian dragoons carry a rifle with a thirty-inch barrel and a bayonet, the Cossacks a carbine, and the rear rank of the hussars and lancers also a carbine, yet there was no instance in all the war in which a thousand cavalrymen fought on foot.

On the whole, the cavalry played a very minor part. The Cossacks are self-reliant and intelligent, and make excellent scouts, but the cavalry in general accomplished but little, and more than once it lost the touch of the enemy.

The artillery arm was well served on both sides; yet, except when used with shrapnel, it killed and wounded but few, had very slight "moral effect," and was an endless source of trouble and delay in the muddy roads and in the mountains. Skobeleff stormed the lines at Cenovo, and thereby compelled the surrender of the Shipka army, *without* the aid of a single cannon. Against Plevna

there were fired from first to last not less than twenty-four thousand rounds of siege artillery, one hundred and sixty-four thousand rounds of field artillery, and ten million rounds of small-arms, or, in round numbers, two thousand tons of iron, one thousand tons of lead, and four hundred tons of powder for the artillery, and only three hundred and seventy tons of lead and seventy-two tons of powder for the infantry. Yet of the fifteen to twenty thousand defenders who were killed and wounded, probably not two per cent. were injured by the artillery; and, as for the fortifications, they were stronger on the day of the surrender than at any previous time, although, of course, the original redoubts were more or less knocked out of shape. On the Russian side the loss from artillery wounds was not over half of one per cent.

In the more open fights, the long range of the muskets keeps the artillery at a distance of not much less than fifteen hundred yards, otherwise its horses will all be lost. At this or greater distances, the shells fall at an obtuse angle, and bury themselves so much in the ground before exploding as to produce but little damage. I have seen a 3¼-inch Krupp shell drop in the very midst of a column of troops and wound only one man. The only really effective service which was rendered by artillery in this campaign was that of the Russian shrapnel (case-shot). Mehemet Ali, Reouf, and Shakir Pashas, all told me that the effect of this was terrible, actually and "morally," while (as on the Russian side) the effect of the shells was little or nothing. There are no hospital statistics in the Turkish army, but I asked several of the English surgeons who tended their wounded to form an estimate of the proportion of shrapnel to musket wounds, and they said ten per cent. I can not believe that it is so large as this, but their opinion gives some idea of the effect of this sort of ammunition when well served.

But the great losses of the war were inflicted, and its battles won, by the invisible, almost noiseless and incessant *rain* of bullets, most of them fired without a pretense of aim. The artillery has greatly lost in its relative importance to infantry; it inflicts little or no personal damage except when used with shrapnel; it does not destroy earthworks, which can be repaired or extended in the night; it does not "produce a moral effect by breaking up the enemy's masses"—because there are no masses in sight, the reserves are kept in some shelter, and the troops actually engaged can not live under the fire of the modern breech-loader in any formation except

successive lines of skirmishers. Considering the trouble and expense which artillery entails, the delay in the bad roads, the transportation of the ammunition, and the difficulty of forage for the horses, it is a question whether, under the conditions of modern warfare imposed by the breech-loading musket, the artillery can not safely be reduced to two pieces for one thousand men, or forty-eight pieces to an army corps of twenty-four battalions (which would be one half of the present Russian organization), and the money equivalent of shells and artillery material be put into small-arm cartridges, to be transported on pack-horses, which can accompany the troops anywhere.

One half the Russian artillery was left on the northern side of the Balkans, and remained there till the month of April.* Of mitrailleuses, I do not know that the Turks had any; the Russians

* While the Russian army was lying in front of Constantinople, previous to the Congress of Berlin, I had almost daily opportunities of seeing General Skobeleff, and discussing the features of the campaign with him. During this time I gave him my copy of this report to read, which he did carefully, noting on the margin whatever suggestions occurred to him. Almost the only criticism of consequence which he made was in reference to this question of the use of artillery, his note being, "In a fight nowadays, concentration of artillery fire on a decisive point is perhaps more important than at Friedland or Borodino. Never was Turkish artillery properly directed." In a subsequent conversation on the same subject he said that the campaign in Turkey afforded no criterion as to the value of artillery, since it was never properly concentrated, and the country was so broken as to prevent its having a fair field, as it would have in the flat, open countries of North Germany and France. The great service rendered by the Prussian artillery in 1870 is well known. On the other hand, it is a fact that, after the arrival of General Todleben at Plevna, the artillery *was* properly concentrated, and for a long while simultaneous volleys of over two hundred pieces directed on a single point were fired once or more every day. The numerical superiority of the Russian artillery silenced that of the Turks, but it accomplished very little damage to men or earthworks. The men constructed dug-outs near the redoubts, and remained in them all the time, so that the fortifications often had a completely deserted appearance, but the instant an infantry force showed itself within a mile of the Turkish lines their parapet broke out into a rattle at once. After the surrender, some of the Turkish redoubts and batteries were so knocked to pieces that they were mere irregular piles of earth, *but this earth was quite sufficient to afford a perfect protection to infantry.*

After reading the original of this report, General Sherman wrote on the back of it as follows: "The experience herein recorded is identical with that of our civil war—save that we used the bayonet but little. Field-guns were reduced to one gun to a thousand muskets. We also used a pack-horse to a company. Mobility, celerity, and good rifles are now the great object to secure victory, and to reap the fruits of victory." W. T. S.

June 23, 1878.

had a few on the "Green Hills" at Plevna, where they did good service in repelling the Turkish efforts to regain possession of those hills. But with a small-arm which can fire six shots a minute, and kill at eighteen hundred yards, all other weapons of destruction are dwarfed in their proportions. Its only limit is in the heating of the metal (which equally affects artillery and mitrailleuses), and in the supply of cartridges. For the latter, any redoubt can easily have (as the Turks did at Plevna) five hundred rounds per man stored in it, and in the open field sixty rounds can be carried on the person, and one hundred and fifty rounds per man on pack-horses (fifty horses to a battalion).

There is one other feature which was specially characteristic of this war, i. e., the traditional fondness of the Russians for the bayonet. The bayonet was *always* carried on the gun, and in the principal assaults in which they were successful (Lovtcha, Grivitza, Gorni-Dubnik, Cenovo) the affair was finally decided by the bayonet, and very free use of it was made in several assaults in which they were repulsed. The percentage of bayonet to bullet wounds was of course very small, but in several cases where the affair came to a hand-to-hand fight it was decided by the bayonet. The Russian soldier is imbued from his first drills with the traditions of the prowess of his antecedents with that weapon, and carefully instructed never to use his gun as a club in a *mêlée*, but always to rely upon the bayonet.

The total losses of the Russians in killed and wounded in Europe and Asia, up to the date of the armistice, as officially reported by the War Office at St. Petersburg, were a little over ninety thousand. To this must be added the losses from sickness, which may be estimated at fifteen thousand, and from freezing in the Balkans, which were not less than ten thousand, carrying the total to one hundred and fifteen thousand. The Turkish losses in killed and wounded were probably ten per cent. less than the Russian; of their losses from sickness and freezing there are no data for an estimate. The Russians took one hundred and thirty thousand prisoners, the Turks less than five hundred. All the Russian losses were replaced, from time to time, by the system of regimental depots, and *ersatz* troops, which aims to keep the organizations always up to their normal strength. These reënforcements kept arriving in small bodies, without interruption, from the time of the second fight at Plevna (July 30th) up to the withdrawal of the troops from Turkey a year later. In a few regiments which suffered most severely there were

at the close of the war not more than fifteen per cent. of the original members, but by this system of constant accretions to existing organizations there was always a nucleus of old soldiers to leaven the mass of recruits, instead of whole regiments of raw recruits and untrained officers.

The Emperor of Russia, accompanied by the Minister of War and other important officers of the Government, was present with the army from the crossing of the Danube to the fall of Plevna. He did not, however, command the army, and abstained as much as possible from interfering with it, but remained there for the purpose of encouraging the men by his presence, visiting the wounded in the hospitals, etc., and of having the head of the War Department with him, so that the wants of the troops might be supplied as promptly as possible.

The command of the army was intrusted to the Emperor's second brother, the Grand Duke Nicholas, a man forty-six years old at the beginning of the war, and, like all the Russian princes, educated as a soldier from his early boyhood. While no one ever claimed that his military talents alone would have raised him to the position of commander-in-chief of a great army, yet, under the personal form of government which exists in Russia, and the great respect and allegiance which every subject in the military service has for the imperial family, it is almost certain that no general could have been found who would have performed his difficult task better than he did. Unfortunately, he chose a staff of mediocre abilities and retained them to the end of the war. But after the endless and almost senseless criticism of everybody connected with the war which now pervades society in St. Petersburg has passed away, it will be remembered that it was the Grand Duke Nicholas whose boldness and decision brought about the winter campaign and the brilliant termination of the war, instead of letting it drift into the hands of diplomacy and foreign intervention while his army was preparing to advance in the spring.

The Cesarevitch Alexander, the heir to the throne, aged thirty-two at the beginning of the war, was also with the army from the crossing of the Danube to the conclusion of the armistice. He commanded the two corps which formed the left wing of Nicholas's army and were posted to protect the army from any attacks from the Turkish forces in the quadrilateral. His *rôle* was purely defensive, and, although he was forced to relinquish part of his ground in September, yet he performed his arduous and somewhat thankless duty with success and ability. His chief of staff, General Van-

nofsky, was a man of fine talents and experience, but there is no reason to suppose that he was of any greater assistance than a good chief of staff always is.

The Emperor's second son, Vladimir, commanded one of the corps under the Cesarevitch; and the third son, Alexis, commanded the torpedo flotilla on the Danube. The two younger sons of the Emperor were present from time to time as spectators only. In all there were twelve princes of the imperial family holding commands in the army, one of whom, the Emperor's nephew, Duke Serge of Leuchtenberg, was instantly killed by a stray bullet in a reconnaissance.

The three generals whose military talents and energy brought the war to a final successful issue were Radetzky, Gourko, and Skobeleff. Todleben's great abilities as an engineer found full scope at Plevna, but he was ordered there only after the investment and siege had already been decided on, and he did not accompany the troops across the Balkans. The only battle at which he was present, or had official cognizance of, was the sortie of the Turks from Plevna on the day of their surrender.

Radetzky was a man of about fifty-five years of age, who had seen service in subordinate grades in the Hungarian insurrection, the Crimea, and the Polish insurrection. His character greatly resembled that of George H. Thomas; beloved by his men, whose wants and necessities were his unceasing study; utterly careless of his own safety or comfort, yet making no parade of this indifference; without brilliant military ideas and somewhat slow, yet loyal and faithful to duty in the highest degree, and full of great tenacity of purpose. His services were almost wholly at Shipka Pass, where, commanded on three sides by the Turks, and constantly attacked with superior numbers, he held on with bull-dog tenacity to the narrow, irregular line of rocks forming his "position," from the torrid heats of August through the rains of October and on to the snows of January; and then, reënforced by troops from Plevna, he captured the entire army in his front after one bloody but short battle.

Gourko was a man some seven or eight years younger than Radetzky, who up to the beginning of the war had seen no active service. At that time he commanded the Second Cavalry Division of the Guard, which was not mobilized at the beginning of the war; but he came to the army as a volunteer, and the Grand Duke Nicholas gave him command of the force which was sent ahead to secure

a pass in the Balkans. His conduct of this expedition was at once bold in conception and sufficiently prudent and skillful in execution to insure its complete success. His division having been ordered to the army, he resumed command of it ; but not long afterward it was seen that it was necessary to relieve the incompetent cavalry general, who was letting all the trains slip through his fingers into Plevna. Gourko was selected to replace him, and when the infantry of the Guard arrived soon afterward, and it was determined to carry the redoubts in Osman's rear and complete the investment, Gourko received command of all the troops destined for the purpose. He carried the redoubts and completed the investment, but at the cost of one hundred and forty officers and four thousand men. The officers being all of noble families, half the society of St. Petersburg and Moscow was thrown into mourning ; and this, combined with a certain lack of tact and personal suavity on Gourko's part, has given him an unpopularity which his really great military services have never been able to overcome—though the losses in this case were due much less to any fault of his than to the inexperience and over-abundant pride and impetuosity of the Guardsmen.

After this, Gourko commanded the force of about thirty-five thousand men sent in the direction of Sofia to prevent any relief coming to the succor of Plevna, and he not only checked the forces forming for this purpose but drove them back into the Balkans. With the fall of Plevna Gourko's force was increased to sixty thousand men, and became a semi-independent army. With this he climbed up through the snow, and turned the two flanks of the Turkish position on the mountains ; in this instance he handled his troops very tenderly, and one column, moreover, was overwhelmed in a snow-drift and turned back, so that the Turks escaped capture ; but they began a retreat which Gourko followed up for over one hundred miles ; and finally, in the battles about Philippopolis in the middle of January, he converted it into a rout, captured all their artillery and dispersed them in scattered, disorganized bands over the mountains to the Ægean Sea. Still the men did actually escape and the greater part of them were collected on the shore of the Ægean and brought in transports to Constantinople, where they formed the nucleus of the army which the Turks gradually formed for the defense of that city during the diplomatic delay between the treaty of San Stefano and that of Berlin—whereas the Turkish army of Shipka went to Russia as prisoners of war. Had Gourko attacked in the Balkans with the same energy that Radetzky and

Skobeleff did at Shipka, and lost five thousand men instead of five hundred, he might possibly have captured the army in front of him just as Radetzky did.

Skobeleff is the youngest and most brilliant of the Russian generals, his age being not quite thirty-four at the time of the assaults on Plevna. He began service as a boy, with his father, who was then a colonel, in the Polish insurrection of 1861. Disliking service in the Guard at St. Petersburg, he sought active duty in the Caucasus and in Central Asia, and passed the ten years preceding the war in those distant countries, almost constantly engaged in warfare, always distinguishing himself, and finally in 1875, at the age of thirty-two, being the major-general in command of the expedition which conquered and annexed the fertile province of Khokand and its two million inhabitants. He came to the army in Turkey as a volunteer without command, but at the passage of the Danube he accompanied the general commanding the division as a mere aide-de-camp, but gave such valuable service and advice as to insure him a command—the Caucasian Brigade of Cossacks. At Plevna, July 30th, he handled these with rare courage and skill. A brigade of infantry was added to his command, and at the assault of Lovtcha, September 3d, the success was principally due to his dispositions. At Plevna, September 11th and 12th, he commanded all the troops on the left flank, and made (according to orders) that heroic but ill-judged assault on the redoubts just south of the town, from which he brought back but four thousand out of twelve thousand men. He was then promoted to lieutenant-general and received a division, and commanded throughout the investment that portion of the line known as the "Green Hills," where he was twice wounded. After the fall of Plevna his division was ordered to reenforce Radetzky at Shipka, and it was his beautiful attack upon the rear of the Turks at Cenovo, just south of Shipka, which caused the surrender of the Shipka army—the Pasha surrendering to him in person. He then received command of the forty thousand men who were formed into the "Detachment of the Advance Guard," and with them, three weeks later, he was almost in front of Constantinople, when the armistice brought his troops to a standstill. He is still in Turkey, and now commands the army of occupation provided for in the Berlin treaty.

His character and career are strikingly like those of Sheridan during the civil war; he has the same dash and boldness, the same personal bravery, and the same profound knowledge of military

principles and their practical application to the case in hand. Should he live through the next thirty years, he will undoubtedly be the Commander-in-chief of the Russian forces in the wars which the present temporary settlement of the Eastern question will surely bring forth, and he will then in all probability establish his fame among the great generals of this century, alongside of Napoleon, Wellington, Grant, and Moltke.

On the Turkish side there are three men—Osman, Mouktar, and Mehemet Ali—who stand out as having, so far as lay in their power, relieved their campaign from the charge of utter incapacity; and a fourth—Suleiman—whose obstinate incapacity aggravated the evils of the system under which he was serving, and who was made the scapegoat for the sins of that system as well as his own, by being sentenced to degradation and fifteen years' imprisonment.

Osman and Mouktar strongly resemble each other, both being about forty-five to fifty years of age, both thorough Turks in race, belief, and looks, both full of honest convictions, and both poor and above suspicion of dishonesty in the midst of the most corrupting temptations.

Osman Pasha commanded the troops at Plevna, and by his skill in its defense brought the whole invasion to a standstill for four months, and inflicted a loss of over thirty thousand men on his enemy. But he thought the Russians would go on for ever assaulting him. Unlike Lee in Richmond, he allowed himself to be invested, and as a result he lost his whole army just before the winter came on.

Mouktar Pasha commanded the troops in Asia, and skillfully took advantage of the scattered condition of the Russian forces and their numerical weakness in the early part of the campaign, and drove them all back to their frontier, and brought the campaign to a stop for over two months until the Russians could bring up more men. Then he allowed a large force to pass clear around his right flank, and himself to be attacked on both sides and crushingly defeated; the *débris* of his army escaped to Kars, and was there assaulted and captured, he himself and fifteen hundred followers having escaped a short time previous.

Mehemet Ali Pasha was of a totally different character from these two. He was born in Magdeburg, Prussia, and was discovered as a stowaway on a Prussian bark, unloading at Constantinople, by Mehemet Ali, the Grand Vizier of thirty years ago, who was attracted by the boy's personal beauty and brightness and adopted

him in his own family, had him educated, and finally sent to the Military Academy. The favor and protection of the old Mehemet Ali, which continued during his life, pushed him forward until his own natural abilities were able to assert themselves. He was already a *Ferik* (division general) when the troubles broke out in Bosnia in 1876, and, in common with Suleiman and Mouktar, he was sent there to command part of the troops engaged in quelling the insurrection. He was serving against Montenegro when the war broke out. When the aged Pasha, Abdul-Kerim, who was commander-in-chief of the Turkish army at the beginning of the war, was relieved after the Russians had passed the Danube, Mehemet Ali was ordered to take command of all the troops in the quadrilateral. His army greatly outnumbered the forces of the Cesarevitch, who was opposed to him, and he drove the latter back from the line of the Lom to the Jantra; then his advance stopped and he retreated to his old positions on the Lom, and was soon afterward relieved from his command. It was the critical moment of the campaign: could he have crushed the Cesarevitch and destroyed the Danube bridge, the position of the Russian army would have been most seriously compromised and their invasion checked for the rest of the year—if nothing more serious happened to them. But Mehemet Ali did not profit by it. He was a man of versatile character, of very considerable ability, speaking three languages with perfect fluency, of ready wit and agreeable manners; but, as might be expected, without profound convictions of any sort. He never acquired the confidence of his army and never overcame the Turkish jealousy of him on account of his foreign birth; he was never able to keep proper discipline among his division and brigade commanders, and was hence unable to carry out his plans, though he had far more military knowledge and natural ability than any of the other Turkish commanders.

He was murdered in October, 1878, as is well known, by Mohammedan fanatics, in Albania, whither he had been sent to appease the inhabitants and compel their submission to the terms of the treaty of Berlin, of which he had been one of the signers.

F. V. Greene.

III.

GERMAN SOCIALISM IN AMERICA.

PART II.

In a preceding paper we have considered the actual condition of the Socialist organization in this country. We now propose first to direct our attention to the great questions of Centralization and State Rights, which must ever play an important part in the consideration of Socialism in America.

Before the great Revolutionary epoch, the political forces of France were represented by a central government on one side and the people on the other. Between the Grand Monarque and the people there was a great gulf, until at last the homogeneity of the popular majority overturned the balance and constituted itself the supreme power to which centralization had led. On the other hand, no dualism, such as had characterized the English Government since the Revolution of 1688, could have brought about such radical changes in the structure of any society. Far less is it at first sight easy to conceive how changes, so revolutionary in their character, could be wrought under a government swayed by such equally balanced forces as the founders of our Constitution would claim to have bequeathed us. But it is questionable whether these forces can be preserved in a balance sufficiently nice to guard our nation from reactionary evils. Centralization, on the one hand, leads to the sacrifice of personal effort. The strict observance of State rights, on the other, so tends to weaken the power of the central Government that in moments of popular commotion the Administration is powerless to act. A remarkable instance of this weakness and ambiguity of our constitutional laws occurred during the late strikes, when a dispute arose as to the power of jurisdiction vested respectively in the State and in the central Administrations.

Much time was consumed in this discussion by telegraph, while the troops remained inactive. The same difficulties have been repeatedly encountered during the whole period of Southern reconstruction.

The extension of the suffrage may be considered the principal cause which gave rise to the earliest development of modern socialism. It conferred upon the working-classes a predominance of political power, and exposed the people to the promptings of self-seeking agitators such as Lassalle. Even in England, where, in Mr. Gladstone's words, "inequality lies imbedded in the very base of the social structure," the general clamor of the age has been yielded to, and, strangely enough, the suffrage was there, as in Germany, extended by the most conservative and bureaucratic of governments. It is from America, the nursery-ground of indiscriminate suffrage, that this most important and most operative of all modern social facts has spread its influence over the lands of the Old World. The political student of the future will note with interest the singular fact that universal suffrage should have found its most congenial home in two countries, the one governed by the most aristocratic, the other by the most democratic system of modern times. Nevertheless in their points of resemblance may be found the kindred causes which expose the American Union and the German Empire to identical dangers. And to these cognate influences may be partially attributed the origin of Socialism in both countries. It is, indeed, in the prevalence of bureaucratic principles in Berlin and Washington that we may seek and find many of the true sources of the modern evil. It is none the less remarkable that in both countries the very centralization which engenders Socialism forms, as we shall presently see, the most powerful bulwark against its spread.

In the struggle for national entity, the German people, by striving to provide the central Government with adequate means of insuring and compelling political unity, conjured down the storm which had been gathering and muttering since the days of 1848. The vast and unencumbered power of the imperial administration had a weakening effect upon the self-reliance of the people by imbuing many with a belief in the more effectual and universal application of the Federal forces. With us in America the late struggle for unity during the civil war lent many of the same characteristics to the Federal Government, and produced, though more silently, similar effects. The Government which arose at Washington after the rebellion was conspicuous for the concentration and responsibility of its powers, and that each fresh extension of the

principles of centralization put forth was a fresh check upon individualism can not be doubted. To this tendency must be attributed much of that reactionary receptiveness which has of late characterized the minds of our working-classes. For, while it can not be denied that protection, which Professor Fawcett regards as the main root of the whole evil in the United States, has carefully prepared our soil for the growth of Socialistic ideas, yet we are not inclined to believe that its influences have operated so powerfully as the champions of free trade in the Old World would have us suppose. To the foreign observer the shackles of protection in the United States must ever appear more confining and coercive than is revealed by a close study of our industrial and geographical development.

That the results of the civil war have brought about, and indeed compelled, many fresh extensions of the principles of centralization is a fact that can no more be denied than the increased reliance on state assistance resulting from these changes. Indeed, the powers which during the period of reconstruction have found their focus at Washington have by their acts far distanced any coercive measures ever adopted by the German Chancellor. The invasion of a State Legislature by Government troops would alone justify this assertion. For the last twelve years the dependence of our people upon the central Government has increased day by day. The power of patronage has grown apace, while bureaucratic principles have attained the highest development ever reached in this hemisphere. With each fresh extension of the principles of centralization confidence in individual effort has relaxed, giving place to state effort and state help. If there is anarchy in the South, the Government must suppress it. If a railway corporation is in difficulty, the Government can assist it. If the commercial interests of the country are paralyzed, Congress votes relief in the questionable form of "cheap money." If sickness, and suffering, and poverty prevail, the state can relieve them. If there is lack of work and widespread poverty, the Administration can bring relief. It is in this condition of mind that the Socialist refugees from Germany find certain classes in the United States, and it is due to these tendencies that it became possible to unfurl the red flag on our shores. But, although it is true that centralization in the United States and Germany has greatly contributed to the spread of reactionary principles, yet we repeat that wherever it has shown its face in either country this very concentration of power has saved society from the impending danger.

Thus, paradoxical as it may seem, centralization has proved itself at once the bane and the antidote of this Social epidemic. This fact is attested in Germany by the enforcement of the anti-Socialist bill, and in America by the employment of the Federal forces during the riots of 1877. So long, therefore, as elements subversive of the best interests of modern society continue to be fostered by certain portions of the community, so long will centralization, despite its attendant evils, maintain itself as the bulwark against the advancing foe. As such, its power must and will be extended before it can be curtailed. It may indeed be doubted whether the feeble forces now at the command of a national Administration would prove adequate against a well-organized and extensive uprising of the laboring classes; nor can the confused and undetermined condition of our laws respecting the autonomy of States tend to strengthen the hands of a Government already paralyzed by Congressional legislation.

None can fail to deplore the gulf which now separates capital and labor. While the intelligence of the country can not but lament the present complete separation of industrial interests, and must view with apprehension the aggregation of vast fortunes in the hands of the ambitious and unscrupulous, and while it should be the earnest aim of all to diminish the great sum of human misery, yet the most dispassionate must fail to see a remedy in the general upheaval of society for the furtherance of such mischievous and impracticable schemes as those advanced by German Socialism. There undoubtedly must come the time when, as Monsieur Louis Blanc once said to the writer, "the relations between governors and governed will find some final adjustment." Time, the great umpire, must decide this grave problem. In no wise, however, can the whole web of social life be unraveled and woven anew, nor can state management be ever brought to permanently and universally supersede individual effort. Such a system of servitude and restraint is alike impracticable and impossible. The actual movement has perhaps in it the seeds of successful and disastrous revolution calculated to destroy all law and liberty. Yet its outcome can never, in the opinion of the wisest economists, the most humane statesmen, and the first philanthropists be anything but chaos. Far from being akin to Socialism, coöperative associations have proved most effectual against the progress of revolutionary principles. This fact has been recognized by the most despotic rulers of the age. Prince Bismarck has on all occasions encouraged the formation of such societies, even so

far as to propose assistance from state funds, and by removing every obstacle which might impede the acquisition of capital for the establishment of the new industry. In the same manner the late Emperor of the French appointed a commission of distinguished economists and statesmen charged with the founding and encouragement of coöperative associations in France.

Experience has abundantly shown that this new industry may be brought to a perfection which will go far to insure the workman an industrial independence. The coöperative credit banks established with so much success in Germany by Herr Schultze-Delitsch, and opposed so violently by Ferdinand Lassalle, have tested the practical value of such combined organization. The number of these banks in Germany is now nearly a thousand, and such coöperative banking societies would furnish excellent substitutes for those inhuman institutions termed savings-banks in our own land. Each member of the bank is jointly and severally responsible for the debt of all. The security thus afforded is so complete that the sums annually advanced often exceed $100,000,000.

Equally encouraging and anti-Socialist in their character have been the coöperative stores organized with such success in England and other countries of the Old World. Modern industrial society has known no greater improvement, and none more likely to extend its beneficent influences over the whole surface of civilization. It is the first step pregnant with practical results which may tend to raise the poor to self-help, intelligence, and competency. The development and encouragement of such organizations in this country would without doubt do much to stay the spread of Socialism in the United States. Indeed, the aim of all capitalists should be to assist the progress of such associations, as being directly opposed to the organic dogmas of modern Socialism, as well as to the perpetration of such rascalities as have been recently practiced upon our people by the corrupt management of savings and other institutions.

In touching the subject of corruption in this country, it would in this article be out of place to yield to the temptation of investigating the grave charge that the American trustee is the most dishonest man ever placed upon this planet. We will not examine a question so foreign to our purpose and so distasteful to our people. More than sixty years ago Daniel Webster spoke the words of truth, if not of practice, when he said :

> These, then, are the evils which threaten the duration of our Government, and against which all the well-meaning and all the wise men should

unite their efforts: the assiduity and impudence of office-seekers, the licentiousness of the press, the abuse and perversion of the right of suffrage, and, above all, the violence of party spirit, which has shown itself in the hands of demagogues the most tremendous engine of mischief ever wielded against the liberties of a free people.*

If during this long lapse of years we have not instituted reform, it has been because the American people have set their face against reform. The Union can never be reformed by an administration, as some would have us believe. It is the administration which must be reformed by the people. But, if the people of the United States prefer organized corruption to honest government, it would seem at least expedient, even from this standpoint, to take timely measures for the preservation of society from the evils so graphically foreshadowed by Lord Macaulay, in a characteristic letter written two years before the civil war to a citizen of Pennsylvania, and of which we feel justified in giving the following extracts:

I have long been convinced that institutions purely democratic must, sooner or later, destroy liberty or civilization, or both. In Europe, where the population is dense, the effect of such institutions would be almost instantaneous. What happened lately in France is an example. In 1848 a pure democracy was established there. During a short time there was reason to expect a general spoliation, a national bankruptcy, a new partition of the soil, a maximum of prices, a ruinous load of taxation laid on the rich for the purpose of supporting the poor in idleness. Such a system would, in twenty years, have made France as poor and barbarous as the France of the Carlovingians. Happily the danger was averted; and now there is a despotism, a silent tribune, an enslaved press. Liberty is gone, but civilization has been saved. I have not the smallest doubt that, if we had a purely democratic government here, the effect would be the same. Either the poor would plunder the rich, and civilization would perish, or order and prosperity would be saved by a strong military government, and liberty would perish. You may think that your country enjoys an exemption from these evils. I will frankly own to you that I am of a very different opinion. Your fate I believe to be certain, though it is deferred by a physical cause. As long as you have a boundless extent of fertile and unoccupied land, your laboring population will be far more at ease than the laboring population of the Old World, and, while that is the case, the Jefferson politics may continue to exist without causing any fatal calamity. But the time will come when New England will be as thickly peopled as Old England. Wages will be as low, and will fluctuate as much with you as with us. You will have your Manchesters and Birminghams, and in those Manchesters and Birminghams hun-

* See article by Daniel Webster, in "North American Review," October, 1816, p. 107.

dreds of thousands of artisans will assuredly be sometimes out of work. Then your institutions will be fairly brought to the test. Distress everywhere makes the laborer mutinous and discontented, and inclines him to listen with eagerness to agitators who tell him that it is a monstrous iniquity that one man should have a million while another can not get a full meal. . . . Through such seasons the United States will have to pass in the course of the next century, if not of this. How will you pass through them? I heartily wish you a good deliverance. But my reason and my wishes are at war, and I can not help foreboding the worst. It is quite plain that your Government will never be able to restrain a distressed and discontented majority. For with you the majority is the government, and has the rich, who are always a minority, absolutely at its mercy. The day will come when in the State of New York a multitude of people, none of whom has had more than half a breakfast, or expects to have more than half a dinner, will choose a Legislature. Is it possible to doubt what sort of a Legislature will be chosen? On one side is a statesman preaching patience, respect for vested rights, strict observance of public faith. On the other is a demagogue ranting about the tyranny of capitalists and usurers, and asking why anybody should be permitted to drink champagne and to ride in a carriage while thousands of honest folks are in want of necessaries. Which of the two candidates is likely to be preferred by a workingman who hears his children cry for more bread? I seriously apprehend that you will, in some such season of adversity as I have described, do things which will prevent prosperity from returning; that you will act like people who should in a year of scarcity devour all the seed-corn, and thus make the next a year not of scarcity, but of absolute famine. There will be, I fear, spoliation. The spoliation will increase the distress. The distress will produce fresh spoliation. There is nothing to stop you. Your Constitution is all sail and no anchor. As I said before, when a society has entered on this downward progress, either civilization or liberty must perish. Either some Cæsar or Napoleon will seize the reins of government with a strong hand, or your republic will be as fearfully plundered and laid waste by barbarians in the twentieth century as the Roman Empire was in the fifth, with this difference, that the Huns and Vandals who ravaged the Roman Empire came from without, and that your Huns and Vandals will have been engendered within your own country by your own institutions.

These are strange and ominous words—the more ominous, indeed, since a few years have in part tested their truth and wisdom. In an age where the events of a whole year of our fathers are often crowded into the narrow compass of a month, sometimes of an hour, we have seen the shadow of Macaulay's prophecy come upon us with a rapidity that would have astonished the great historian himself. The sails of the Constitution are still set with the stars and stripes streaming at the fore, the mizzen, and the peak. But the

anchor is still wanting, and we are drifting carelessly and swiftly onward to the unseen rocks ahead. No Cæsar or Napoleon has yet seized the reins of government, but who can tell the day or the hour when the safety of civilization in this hemisphere will call for one? In that dark hour he will appear as surely as Napoleon succeeded Robespierre, or our civilization will perish. One legislative act alone on the part of Great Britain exasperated by commercial depression would bring unexampled distress upon our people. A retaliatory tariff enacted by the British Parliament could for a time paralyze all the industries and agricultural interests of the United States. And, when it is considered that about seven tenths of our population are engaged in agricultural pursuits, it seems difficult to predict the future which a few years hence awaits this preponderating portion of our people. England, to the detriment of her own agricultural interests, now consumes two thirds of our agricultural products. American wheat and corn are at present sold in Liverpool at lower prices than they can be produced at in England. The demand in England for agricultural products can certainly not increase in the same ratio with our rapidly growing supply. And, when it is considered that the agricultural supply of the rest of Europe by far exceeds its own demand, it is not easy to foretell the fate which awaits the landed interest of this country.* With the dangers which even a temporary depression of industrial interest would threaten, shall we calmly and inactively await the complete fulfillment of Macaulay's words, or shall we seek such antidotes as will avert the day of danger?

The political pharmacopœia should prescribe such remedies before the disease is past cure. These lie as much in the jealous protection of the rights of society and government as in the mitigating influences which may be brought to the assistance and protection of the poor. All conspiracies against the body politic should be more zealously detected and punished than those against individuals.

* This paper was in print previous to the recent indications of a return to protection in England and in France. In the recent debate in the House of Lords on the commercial depression in England, Lord Beaconsfield acknowledged that the depression of agricultural interests was unprecedented, and that the depression was anticipated when protection was abolished. He declared that the estimated loss of the public wealth had diminished by £80,000,000 sterling, and that the area of land under cultivation had diminished by one million acres. On the 30th of March last a delegation from agricultural committees, in sixty departments of France, called on President Grévy with resolutions against the renewal of the treaties of commerce, and in favor of the protection of wheat.

Plots against the life of the Government and existing society should call for the same legal limitations that are enforced against any plots designed to assail the life or freedom of individuals. Destitution should be reduced by coöperation in its best estate, by an extensive organization of industrial institutions, providing temporary work for the workless of every class, and facilitating the readjustment of vocations. If necessary, such organizations should be encouraged, though not absolutely supported, by the State or Federal administrations. By preserving a proper balance between centralization and State rights, the central Government should rigorously extend its protection to those who have no power to protect themselves. Thus legal limits should be imposed upon the length of a day's work for children. The indigent poor should be relieved by a system of charity based upon the French plan, which is ever prepared to meet even unforeseen emergencies, and which is to-day the only one approaching perfection. It is not calculated to weaken individual or national character, nor does it incur such waste as is common in our own charitable distributions. Through lack of a perfect, permanent, and general system, our own benevolent institutions effect comparatively little good. The Federal powers, while preserving supreme authority in supreme emergencies, should, however, vigorously repel all assaults upon individual responsibility.

But even at the risk of slightly extending its functions the Government should set its face against certain monopolies which are calculated to disturb the peace of the country by aggregating into single hands gigantic fortunes. Indeed, this country, ever distancing in magnitude the precedents of other lands, boasts fortunes which can be matched neither by the proudest peer of England nor the richest of the Rothschilds. Twenty years hence these fortunes, already overgrown, will in the ordinary course of events have at least quadrupled, and none can tell for what effects they may be responsible unless wielded by men of unexampled wisdom and unflinching justice. At the same time the rights of property should be jealously asserted both in the Legislature and in the court of justice. We have recently seen the Legislature of a great State, despite the protestations of property-holders, grant to certain elevated railway corporations rights possibly ruinous to many private interests. Such acts prepare the way for further decisions of a marked communistic character. Not less so were the Granger decisions given by the Supreme Court some years since. It is impossible to overstate the magnitude of the peril thus handed down by tribunals

from which there can be no appeal. No intelligent property-holder, no thoughtful mar of business, can view it with composure, indeed hardly without terror.

It is true that, with the advent of free trade, and the rapid reduction of the national debt, some of the present dangers may vanish. Nor can it be doubted that colonization, coupled with an enforced but limited protection against creditors, after the manner of the homestead law, would go far to relieve the busy centers of the Union. But all the antidotes that the mind of man could devise would not silence the seditious tongues that are daily pouring their venom into the souls of the people. An end should be put to all plots against society. The man of capital, and the man whose only capital is his labor, should alike wish it. Let Congress, by investigating the principles and proceedings of the Socialistic Labor party, first assure themselves of its pernicious nature, and then let it proceed to destroy by legislation this network of conspiracies. Let our legislators next assure themselves that the organization is led and inspired by German agitators, and, if they are true to their trust, they will proceed to a general revision of the immigration laws. A thousand Chinamen can not bring to our shores the mischief that is brought by one apostle of Lassalle. The time has come when America should cease to be the "dumping-ground" of Europe. Horde-like immigration, with its collateral consequences, if it ever was a blessing to the United States, has ceased to be so now. It has become the curse of an answered prayer. Not only has it reduced to one half the population of pure and genuine descendants of the choicest race that in modern times has dwelt upon the earth, but it has peopled our soil with the worst refuse of other lands. It would indeed seem high time that legal limitations be at once imposed upon indiscriminate immigration.

No one can blame Prince Bismarck for the sagacity with which he secretly encourages the emigration of German Socialists to the United States. The application to this purpose of the enormous sums supplied by the secret-service fund and of the revenues derived from the confiscated estates of the Crown of Hanover, is a fact well known to many statesmen of Europe, though ignored by our own. Our daily papers are constantly announcing the fresh arrival of Socialist leaders driven from their own country by the recent repressive measures. It is not to the German Chancellor that we must look for protection against these importations. It is to our own Government, which is highly censurable for not taking notice of such arrivals, as

was done by Secretary Fish, though unfortunately but on one similar occasion. In Germany the Imperial Government, supported by the Church of Rome, is straining every effort to drive the Socialist from his native soil. Count Cavour once predicted an Ultramontane alliance with the Socialist movement, and for some time the tide of events seemed to turn in that direction. But, whatever the ultimate results may be, the bull lately issued by the Roman Pontiff against the German Socialists plainly indicates that the astute mind of the "man of blood and iron" has enlisted on his side the powerful influence of Leo XIII. Every nerve is strained to eradicate the evil spirits by proceedings before which some of the persecutions of the middle ages must pale, and which invoke emigration as a blessing. The two millions of human beings recently disfranchised by the German Reichstag are indeed in a plight which must excite the pity if not the sympathy of their direst enemies. For them there are "no judges at Berlin"—none of the peaceful and unmolested reunions in which the German heart delights—no meetings with closed doors—no common purse—no journals or publications advocating their own views—no printer, no publisher, no bookstand, to give their writings to the world—no tavern to offer an asylum—no social chat over the accustomed "lager"—no singing society, no charitable association, no reading club, not even a prayer-meeting. The police is everywhere omniscient and omnipotent. All meetings, unions, or associations, either guilty or open to the suspicion of being guilty of encouraging socialist opinions or theories subversive of the existing order of society, are declared to be illegal. No opportunity is afforded to the Socialist for proving his innocence. Not even the public law courts are left to determine whether an offense has been committed. The *lois des suspects* enacted in France by the Second Empire was in principle mild compared with the measures attending Prince Bismarck's crusade. The iron will and hand of the police alone have jurisdiction over millions of German citizens, and the steps by which suppression is enforced are of a character so drastic and arbitrary that exile becomes a boon compared with the suffering to be endured under the ban of the new law. And America alone offers to these outcasts the hope of unmolested combination. With these facts before them, will the people of the United States persist in their usual course of apathy so long as their apparently immediate interest is not affected? Then let them consider that not only the best interests of society, but the best interests of property, are at stake. On the eve of grave events

our people are ever more sanguine than those of other countries. It was so before the great war of secession. It was so before Black Friday. It was so before the strikes of 'Seventy-seven. No sooner did the danger become visible, than all marveled how it could have come so suddenly upon the country. Yet, in the case of the strikes, we had had our warning on the day succeeding the Christmas of 'Seventy-six.

The part of Cassandra is ever an ungrateful one. We are far from disposed to predict that the Commune will rage or reign here to-morrow or next day. In the history of a people a few years count as nothing. The industries of the country wear for the present an improving aspect; but the dark hour of commercial depression must come again, so surely as the night succeeds the day. The plant which has found root in our soil must be killed before it bursts upon us full-blown. The powerful and growing organization which now honeycombs the country must be laid low before we have forgotten the smoldering fires of Pittsburg and the insurrection which extended through fourteen States of the Union —an insurrection which destroyed millions of property and hundreds of lives, in many cases successfully defied the local authorities, and for the first time in American history revealed its power to an organized mob.

No thoughtful man can dwell upon our defenseless future without fear and apprehension, although the great mass of our people close their eyes to dangers past and coming. With that same tranquillity and inward satisfaction with which honest Lucretius gazed from the land upon the wrecking ship, does the average American mind view the mighty struggle now waging in the German Empire.

Yet never since the rebellion did a graver question present itself for legislation. The Administration or the man therefore that will call the attention of Congress to the necessity of suppressing all conspiracies against the Government and society, as well as to the necessity of radically revising the immigration laws, will have deserved well of future generations. Continued ignorance of the true condition of the social substrata which are showing themselves in our own land can only lead to lawlessness or force, and perhaps to the fulfillment of Mr. Carlyle's spiteful epigram, which declares the United States to be but "an anarchy plus a policeman."

IV.

ABSENT FRIENDS.

It is the purpose of this paper to recover the forms of half a dozen men, distinguished in the annals of the country, and closely associated with the "Review." Men of letters were they all; men of letters by both predilection and practice; men of letters, in all but two instances, by profession; and in these two the literary element was probably the most enduring title to fame. Bryant, though a journalist, will owe to poetry his immortality; and Cushing, though a lawyer, will be longest remembered as a man of great intellectual versatility, a brilliant writer, talker, and speaker, a devourer of books and thoughts. Hillard was a lawyer, too, by profession; but his legal career is so completely eclipsed by his literary achievements that scarcely a trace of it remains. Dana, Motley, and Taylor were men of letters purely.

Richard Henry Dana, who died in Boston on the 2d of February last, in his ninety-second year, was one of the founders of the "Review," which amounts to saying that he was one of the pioneers of literature in the country, one of the inaugurators of the literary life. He was then in the practice of the law, about twenty-seven years old. His passion for literature thus early prevailed over the uncongenial habits of professional life. His connection by marriage and kindred fostered this predilection. Washington Allston, who married his sister and lived near him in Cambridge, was a man of genius, and, had he been less famous as an artist, would have been eminent as a writer. Dr. William Ellery Channing, the philosophical—rather, one would say, the imaginative—preacher, who took theology up into the region of the higher intelligence, and suffused the questions of religion, as well as all other questions, with the luminous atmosphere of thought, was his cousin. Edward T. Channing, scholar, writer, and critic, was his intimate

associate and fellow laborer in the work of establishing the "Review." It is not to be wondered at that influences so powerful as these, coinciding with strong individual tastes, should have diverted the young man from pursuits for which he had no keen relish. It is not to be wondered at that the preparatory studies for the Boston and Baltimore bar were productive of little professional fruit, or that the office in Boston was soon closed. Nor is it to be wondered at that a brief course of politics was enough for his ambition, that even membership in the State Legislature did not satisfy the cravings of his mind. He had no hunger for wealth, being moderately provided for by his patrimony, and being by disposition unworldly; no passion for power, no desire for popularity. His manliness, and he had a good deal, of a rare kind, appeared under other forms, in the shape of individual opinions on the questions that addressed themselves to the intellect. He was one of the foremost to recognize the claims of the new school of poetry represented by Wordsworth, and did his part to revive an interest in the great writers of the classical epoch of English literature. As one of the editors of the "Review" he protested against the dominion of didactic writers like Alexander Pope, whose star was then in the ascendant, and with uncompromising vigor defended the higher standard, which was excessively unpopular in England and had no reception in America. In this task he was an educator of his countrymen, a prophet of the better future, which the "Review," under the management of his successors, was effectual in establishing. His first pieces were written for its pages; the "Essay on the Old Times" was printed here; here appeared his article on the poems of Washington Allston, not at that time related to him by marriage. Whatever he wrote was characterized by a conservative purity of diction, free from quaintnesses, affectations, and novelties, as well as by a kindling force of intelligence which compelled attention. He was felt in the quality of his work, which was interesting and significant, but not much in conformity with the prevailing standards of taste. His friend Bryant, speaking of "The Idle Man," which came out in numbers, in 1821–'22, and met with a cold reception from the general public, said: "One reason why it took so little at its first appearance was probably the hardihood with which its author slighted the venal arts of attracting the public attention and conciliating the public favor." . . . . And these forbidding peculiarities were not, the critic thought, relieved by the charms of imagination, by descriptive power, or by expressions of feeling. The tone was

severely intellectual. The author, to use once more the language of Mr. Bryant, "loves to describe a peculiar and unhappy mood of the mind, cherished, as if by a kind of fatality, instead of being healed by the succession of events and the lapse of time; drawing into its vortex all the lesser and feebler emotions, and making them its own nourishment." With all these qualifications, the critic calls the writer a man of genius, and ascribes to him the highest literary qualities, a pervading and hallowing delicacy of the moral sentiment, and a rare susceptibility to the influences of external nature.

A similar judgment the same friendly critic pronounces on Mr. Dana's poetry: "There is the same propensity to deal with strong and gloomy passions, with regret, remorse, fear, and despair; with feelings over which present events have no control except to aggravate them, and which look steadily back to the unalterable past, or forward to the mysterious future." The style is pronounced occasionally abrupt and harsh, with now and then an unpleasant homeliness of expression. On the whole, the praise is not exuberant; and if so indulgently disposed a critic as Mr. Bryant must have been is grudging of plaudits, the modern reader, having no personal predilections, and educated in a very different school, may be pardoned for admitting a much qualified gratification from the perusal of "The Dying Raven," "The Husband's and Wife's Grave," and "The Buccaneer." To tell the plain truth, these poems are not at present easy or delightful reading. The occasional beauties of expression, a few musical lines, here and there a graceful description of some natural object, do not redeem the somber monotony of sentiment. A course of lectures on Shakespeare, eight in number, prepared at the instance of Dr. Channing, and read with great acceptance before cultivated audiences in Boston, Philadelphia, and New York, but never printed, are spoken of with much enthusiasm as precious contributions to the literature of the subject. The study of Shakespeare was one to call into action his best powers as critic, expositor, and poet. There was an unlimited field for his genius and his grace. His enthusiasm was always kindled by the classic authors of England, and it was not readily stirred by any others. Mr. Dana was no sentimentalist. His taste was exacting, his judgment austere; and, however limited his own domain, he could enjoy a wide range that was opened for him by others. Perhaps he enjoyed this the more because his own range was so narrow.

It is a favorite theory that Mr. Dana's fastidiousness restrained him in the exercise of his creative genius; that, preferring quality

to quantity, he was content to produce a very few pieces of prime excellence. But this explanation can hardly be received as final. To say nothing of obvious defects in the quality of his work as far as it is accessible to us, the natural constitution of his mind, as exhibited in other ways, accounts both for the limited quantity of his intellectual production and for a certain dryness and thinness in its substance. He had no craving for expression, literary or social. He was a silent man, for the most part. His thoughts did not readily come either to his pen or his lips. He was deficient in the sense of humor, and consequently in the feeling of sympathy with other minds, which prompts communication. He was deficient in wit, and consequently was never a delighted spectator of the nimble achievements of his own mind. He observed and reflected. He read, too, and much; but it was in foreign literatures, and in the works of the elder bards. His acquaintance with the English classics was intimate. He was well versed in the politics of the mother country, was familiar with the attitude and the career of her statesmen, and could talk well on the current topics of her society. He was, moreover, conservative in politics and religion. His only appearance in home politics was as a champion of the Federalist party, and it was a general impression that in mature life his predilections were for the monarchical form of government. When the divisions arose between the Unitarians and the Trinitarians, Dr. Channing was on the one side and Mr. Dana on the other. He was then a Congregationalist. Subsequently he joined the Episcopal Church, and was a quiet representative of high-church principles.

The passion of his soul was for Nature. He loved her unadorned. He adored her in silence. In his summer home, at Manchester, a secluded, remote, weird, and lonely place on the seashore, far from the public road, distant from human dwellings, in extreme simplicity, the poet loved to be alone. The touch of art was not visible about him in field or wood. Before the square house, designed, we believe, by Allston, at the foot of a steep declivity of rock and sand, stretched a wide, long beach, terminated at either end by jagged masses of stone, and shelving so gradually that at one point, when the tide was low, there was a broad, dry passage to a wooded island which lay at a little distance from the coast. There the poet, with form erect, his flowing hair and beard blown about by the wind, would walk up and down, absorbed in thought and emotion. He loved to be alone; he desired no companion. The friend, if he had one, was some literary guest whose most accept-

able speech was his silence. Last summer, the old man, thin and weak, but bright of mind and eye, sat on his little piazza and looked out on the ocean; but he could no more walk the beach. His mind had gone into itself.

William Cullen Bryant was introduced to Mr. Dana through the medium of "Thanatopsis," which was published in the "North American Review," anonymously, in 1817. Its extraordinary character stimulated the editor's curiosity, and led to a friendship which lasted through the years of a long life. The two men were in most respects strikingly dissimilar in temperament and intellectual convictions. Neither in politics nor in religion were they sympathetic. But their literary tastes were in accord. Both were purists in the matter of style, and conservatives in the matter of sentiment. Both loved the classic authors. Both were contemplative and interior. Both were more inclined to silence than to speech. Both had the adoration of Nature, and were observers of her moods. By the seashore or in the country, they would be together, without conversation, each communing with his own thoughts. It is not improbable that Mr. Dana's admiration for "Thanatopsis" was aroused by the deep reverence for Nature that pervaded its stately lines.

This solemn veneration for Nature is, indeed, the characteristic of the poem. It was the first of those studies which disclosed the real bent of Bryant's mind. When first printed, it was preceded by four stanzas, commonplace and conventional to an extraordinary degree, which read like a farewell to the somber associations of the hard New England life and the grim New England theology. The last stanza runs thus:

> This bitter cup at first was given
> When angry *Justice* frowned severe,
> And 'tis the eternal doom of Heaven
> That man must view the grave with fear.

The lines are a fitting introduction to the poem which follows, and it is not surprising that the editor printed them together. The longer poem was calculated to change the mood suggested by the dismal verses, which correspond in sentiment to the lines afterward added to "Thanatopsis" in later editions. Nature, the poet would say, is not under the curse. This idea is directly expressed in the "Fragment," afterward called "Inscription for the Entrance to a Wood," which was published along with "Thanatopsis," and immediately after it:

. . . . The primal curse
Fell, it is true, upon the unsinning Earth,
But not in vengeance. . . .
Hence, these shades
Are still the abodes of gladness.

The "Fragment" is warmer in feeling than "Thanatopsis," which was written earlier, but the key-note is the same. Both are poems of reflection, passionless and colorless. "Thanatopsis" is the more colorless and passionless of the two. It is neither melancholy nor gloomy; it is simply stately and grave.

The piece, as originally published, was much shorter than our version. It began at what is now the seventeenth line—

Yet a few days and thee,

and it ended sixteen lines earlier than our form, with the words—

And make their bed with thee.

The Greek spirit of the poem is disclosed in the title and in an occasional phrase like the "all-beholding sun," which suggests the poets whom the elder Bryant loved. The writer himself thought so little of his production that he threw it into a drawer instead of hurrying away with it to the printer. It was apparently with him a product of reflection rather than a work of creative genius. "Thanatopsis" is a meditation.

Bryant was a lover of Nature, and a keen observer of her forms. He caught the sentiment of the woods, the birds, the flowers, and he possessed a happy gift of expression, not always poetic, but accurate, smooth, and graceful. He was not a man of strong emotions; not a man of many words. His observation of Nature was more remarkable for accuracy than for insight. His perception was less sympathetic than clear. It is interesting, in this connection, to compare Lowell's poem "The Bobolink," published in his first little volume, "A Year's Life," and beginning—

Anacreon of the meadow,
Drunk with the joy of spring,

with Bryant's "Robert o' Lincoln," one of his last and most delightful effusions. Bryant describes the bird, his plumage, his habits, his domestic and home life, giving a charming imitation of his note and a pretty picture of bird-existence. Lowell attempts nothing of

this kind, but makes one feel the thrilling glee, the heedlessness and overflowing joy of the little songster. Similarly contrasted are the two poems on "The Fountain," published by the same men. Lowell expresses the soul of the leaping water, Bryant moralizes on the lapse of the running stream.

The temperament of Bryant was pensive, inclined to sadness. At the close of his essay on "The Happy Temperament," printed in an early number of the "Review," occur the following sentences, which contain the key to his poetry as well as to his life: "In short, the melancholy feelings, when called up by their proper and natural causes, and confined to their proper limits, are the sources of almost all our virtues. The temperament of unbroken cheerfulness is the temperament of insensibility." This philosophy may be a favorite one with the workers and fighters who perform the drudgery of the world, and take the blows that are aimed at reformers; but it is not congenial with poets or men of letters, who have faith in sunshine, and who believe that in order to be good they must be happy. The radiance in Bryant's poetry is like the gleam of sunlight upon a snowy landscape, like the music of a brook singing a cheery tune beneath the ice. His verses usually end with a thoughtful moral which connects their melody with the tender experiences of a chastened soul. An autumnal wind sighs through the woods. The foliage is touched with frost.

Bryant was a man of reflection—grave, serene, patient. He "meditated his Muse." In a letter to a friend, written in March, 1871, Mr. Bryant thus described his habits of life: "I rise early, at this time of the year about half-past five; in summer half an hour or even an hour earlier. Immediately, with very little incumbrance of clothing, I begin a series of exercises, for the most part designed to expand the chest, and at the same time call into action all the muscles and articulations of the body. These are performed with dumb-bells, the very lightest, covered with flannel, with a pole, an horizontal bar, and a light chair swung around my head. After a full hour, and sometimes more, passed in this manner, I bathe from head to foot. . . . My breakfast is a simple one—hominy and milk, or, in place of hominy, brown bread, or wheaten grits, or oatmeal, and, in the season, baked sweet apples. Tea and coffee I never touch at any time. . . . My drink is water, yet I sometimes, though rarely, take a glass of wine. I am a natural temperance man, finding myself rather confused than exhilarated by wine. I never meddle with tobacco, except to quarrel with its use. . . . I abomi-

nate all drugs and narcotics, and have always carefully avoided everything which spurs nature to exertions which it would not otherwise make."

None but a calm, equable, self-poised, self-contained man, patient, regular, not subject to moods, unvexed by "nervousness," unexcitable, cool, deliberate, can pursue for years a regimen like that here described. We doubt if another poet or creative mind in the world does or ever did it. We say nothing against the rules themselves, which are excellent, and must have an admirable effect on the person who can put them in practice. The ability to put them in practice is the marvel. The man who has the patience and perseverance for that already possesses the virtue which the regimen confers. He has the prudent disposition of the sage, hardly the burning temper of the man of genius.

This quality of calm persistency stood Mr. Bryant in good stead as a literary man. Through the force it gave him he was enabled to begin, continue, and finish his translation of Homer, that admirable performance which sustained and consoled him in years of severe affliction. The translation has not the ring and roar of the original; it shows us Homer chastened and subdued; but it is faithful, musical, refined, and is, on the whole, the best of the English versions. All there is is Homer. The translator had the modesty as well as the judgment to stand behind the original and reproduce as much of it as he could. If he could not reproduce the whole, he would at all events forbear to eke out his deficiencies with his fancies.

Mr. Bryant's contributions to the "Review" extended over a long course of years, and numbered in all sixteen pieces. Thus, during the greater portion of a protracted and busy career, he fed the fountain of good letters, and aided the cause of elegant scholarship in the country. The service he rendered in this way was of the most enduring and valuable kind. To rank him with the mighty bards of the world—with Homer, Dante, Milton, Goethe—would be to cast on him the reproach of satire. To rank him with his great contemporaries in English verse would be extremely injudicious. A place will hardly be assigned to him by posterity on a line with the Victorian poets or the authors of the highest mark among his countrymen. But, as a steadfast friend of pure literature, he stands preëminent. None put so modest an estimate on his performances as he. Posterity will add this grace to the wreath that is placed on the head of the man who never allowed

the discords of the worldly life to disturb the harmonies of his spirit.

John Lothrop Motley was an infrequent contributor. Only three articles came from his pen; but they indicated original powers, clear and strong convictions, independent research, and literary capacity of a high order. His three topics were "Peter the Great," "Balzac," and "The Polity of the Puritans"—three topics as well adapted to exhibit an author's intellectual qualities as any that could be selected. In his treatment of them there was nothing commonplace or conventional. The historical papers were not bald summaries of books under review, but fresh studies by a thoughtful student of affairs; and the judgment on Balzac was not merely the impression of a reader of the Frenchman's novels, but the opinion of an intelligent man on the true province of art in works of fiction. Bright glances are thrown upon other writers, which exhibit a remarkable affluence of mind. Of Goethe he writes, in 1847: "We have always considered him a great naturalist. His pursuit is always truth, natural truth, which he delights to track through all its external manifestations up to its living principles. He was no moralist, but a student of universal nature, both physical and metaphysical, who watched the sprouting of a hyacinth or a passion, the combination of an alkali and an acid, and the conflict of the affections, the efflorescence of a carnation, the revolution of a people, the eruption of a volcano, all with equal attention, and classed them all as natural phenomena, each as worthy to be studied as the others. It is for this reason, among others, that many people have discovered that he is a very immoral writer. The same persons should denounce the immorality of Professor Agassiz, because, for instance, he informed the respectable people of Boston that, in a certain family of the *Radiata*, every female always marries her grandfather."

Of another distinguished author he writes: "George Sand is no doubt a philosopher, and her style is better than that of any modern French writer; but she always reminds us of what Yorick told the Count de B——, in the 'Sentimental Journey,' 'The only fault I have to find with your nation is that you are too serious.'"

Of Balzac himself he says: "As for his philosophy, his principles, moral, political, or social, he seems to have none whatever. He looks for the picturesque and the striking. He studies sentiments and sensations from an artistic point of view. He is a physiognomist, a physiologist, a bit of an anatomist, a bit of a mesmerist,

a bit of a geologist, a Flemish painter, an upholsterer, a mineralogical, misanthropical, skeptical philosopher; but he is no moralist, and certainly no reformer."

And this, Mr. Motley thinks, is to the writer's credit as an artist in fiction. Mr. Motley reads novels first of all to be amused. He declares himself "a little fatigued with the reforming tendency of writers of fiction, the authors who are for changing everything, abolishing everything, and who have a radical objection to everything in existence."

This is the true literary spirit. It is not at all inconsistent with moral earnestness, only the moral earnestness must not be introduced in the wrong place or in the wrong manner. One may have a profound respect for the conscientious and untiring zeal by which abuses are attacked and overcome, and yet dislike to see novelists devoted to the work. "No doubt," says Mr. Motley, "the country needs reformation—the world needs it; but in the mean time let us occasionally be amused, and let novel writers think less of reforming and more of amusing." If there must be a large infusion of French novels into American literature, he would prefer more of Balzac and less of Sue or Sand. For Balzac, too, takes the world as it is. He is essentially an artist who accepts the materials which society affords. If they reveal a vicious or disorderly condition of society, society, and not the artist, is responsible. Mr. Motley's historical works show no lack of moral conviction; his enthusiasm is always for the really noble in character and achievement, and his reprobation falls inevitably on the mean and base; but he is never a dogmatist or sectarian. Of Puritan stock and nurture, he clearly perceived and frankly criticised the defects of the Puritan character, and would not be betrayed into unjustifiable eulogium of men because they happened to be the historical predecessors of principles that he admired. He has little patience with writers who exalt Puritanism, because democracy, unintentionally, as he thinks, grew out of it. "The New England fathers," he says, "had no notion of establishing a democracy. . . . The real reason why the democratic principle prevailed was because it is a true principle, and because it never before had so fair a chance to develop itself. . . . The virtues of the Puritans were many and colossal; their vices were few but formidable, for they were intolerance, cruelty, tyranny, and bigotry. . . . They came here to establish not liberty of conscience, but the true Church. The people, as such, had no rights at all. . . . A true picture of those early times would present this quaint, sol-

emn, arbitrary government keeping the people as tight as a drum, prying about, and thrusting its primitive and patriarchal nose into everybody's business, and meddling with the most minute and trifling matters." Bancroft's history is described as a work of genius rather than of laborious detail, which owed its success to a "vigorous imagination and a crisp, nervous style."

There is an impression that Mr. Motley was an aristocrat, exclusive and exalted, a defender of anti-democratic institutions. The paragraphs with which the article on "The Polity of the Puritans" concludes would remove that impression, if any labored attempt at its removal were called for. He counts it an advantage to America that she has no past, and consequently is untrammeled by traditions. "America has no past, but she has a future. The possible future of this country is as exciting to the imagination as the vague and fading past of other lands." This sentence is followed by a brilliant passage, too long for quotation, portraying the splendors of the period when the States, confederate and compact, numbering three hundred millions of freemen, will be "distinguished for progress in those beautiful arts which embellish life, and appeal to the higher parts of a nation's character, as well as for those useful ones by which the happiness and comfort of the citizens are secured."

Mr. Motley was an intellectual man, of high attainments. His associations with wealth and refinement only added grace and dignity to a nature of rugged nobility, and made him a prophet of humane ideas among people whom Matthew Arnold describes as "barbarians," namely, the so-called upper classes of society. It is so unusual for intellect and conscience and noble art to be associated with opulence and social position that such an example as Mr. Motley presented should be held in special honor. His place in American literature is his own. It is pleasant to find in the pages of the "Review" so clear a presage of his fame.

Of the six men we have chosen for our portrait-gallery, Caleb Cushing was the most copious and varied. The index mentions thirty-five articles from his pen. His subjects were of great diversity: law, civil and criminal, in principle and practice, national, international, municipal; history; biography; education; botany; fiction; discovery; the civil and legal condition of women; coal; romantic adventure; in fact, almost everything that was of interest to his contemporaries, from Perri's "Roman Nights" to the civilization of Central America. He always wrote with a free hand and

with fullness of information. His interest in Mexican and South American problems was particularly keen. He was perfectly at home with Spanish affairs, and seemed familiar with the vast range of subjects connected with them. His papers were not remarkable for brilliancy of style or richness of suggestion. They contained few touches of surprising talent, none of genius; but they abounded in good sense, and were never deficient in learning. There is never the least approach to levity; the tone is high, the thought is grave and weighty. Even such a theme as "Boccaccio's Decameron" does not tempt him to depart from his usual decorum.

This versatility of mind was in part answerable for a common impression that Mr. Cushing was superficial and even shallow. The generality of men find it hard to believe that interest in many subjects is compatible with thoroughness, accuracy, or depth. Still less are they disposed to think that interest in many subjects is compatible with moral sincerity. Earnestness is usually associated with narrowness of some kind. Intensity of conviction, and even heartiness of conviction, goes, it is conjectured, with monotony of opinion. The prejudice is countenanced by many facts of common experience. It is true that in most cases steadiness of moral feeling and fixedness of opinion are found together. The current is strongest in the stream which is most confined between precipitous banks. When the banks are removed the water spreads out into a still marsh, and soon becomes stagnant. All-sided people are prone to be moral skeptics. They can not give themselves to a single cause—they can not attach themselves to a party or be devotees of a creed. It is by limiting the gaze to one view that the will becomes fixed and the emotion centered. Largeness and openness of vision are almost always attended by fluctuation in the moral sense. Partisanship is peculiar to the fanatical. Men like Goethe, whom Matthew Arnold calls "the greatest critic perhaps that has ever lived," are, according to Mr. Motley, neither moral nor immoral. An ordinary power of conscientiousness would have been out of all proportion to the inordinate versatility of an intellect like Mr. Cushing's, who should have been endowed with a prodigious moral sense to balance the vigor of his mental processes. The examples of men who have been greater in intellect than he was, and correspondingly great in conscience, are scarcely to the point; for these men have, for the most part, been attached to a fixed system, political or religious, which confined their genius within certain speculative limits, and forbade any wide excursions of their faculties.

They were shut up to a view, though their vision may have been far-reaching and their glance penetrating. Mr. Cushing belonged to the least restricted of the learned professions, and lived in a community which countenanced the widest diversity of opinion on all subjects. That he was an able man as well as a versatile one was proved in many public and extra-professional ways. That he was an enlightened and humane man is evidenced in many of his writings. That he was capable of large views appears abundantly in the papers we have described.

The question of the legal and social condition of women is one that calls forth strong opinions on either side, and, perhaps more than any other, tests the independence of disputants. Two of Mr. Cushing's articles treated this matter. The article on "The Legal Condition of Woman" was printed in April, 1828; that on "The Social Condition of Woman" in April, 1836. In neither paper does the writer take the position of the modern reformer; he does not, that is to say, advocate the extension of the franchise to women; but he does make distinctions and lay down principles which strike at the heart of much popular prejudice. The technical opinions are conventional, but the general course of argument is humane. "We do not propose to ourselves," he remarks in the first article, written, it must be remembered, fifty years ago, "to set up for the female sex any extravagant standard of legal privilege, nor to lay lance in rest for the support of quixotic pretensions, in her behalf, to political or municipal rights adverse to those of the male sex. The constitution of nature, ordained by no human conventions, recorded in no fundamental charter of government or petition of rights, but written over the face of the universe, and stamped indelibly upon the very organization of our race, has, we conceive, settled the question whether the female sex should exercise political franchises equally with men." On the next page he writes: "We do not esteem it any hardship, as some have done, that the property of an unmarried female is taxed without being represented. Taxation procures for property the protection of the body politic; and neither the alien friend who claims the safeguard of our laws, nor the unmarried female, nor the minor, whose estate the government guarantees against domestic pillage and hostile invasion, has just cause to complain of exclusion from elective privileges." He protests against the "pernicious facility of divorce," and doubts whether any nation will ever renew the experiment, which was tried in France during the Revolution, when marriage was reduced to a union so

loose and transitory that it was described as "the sacrament of adultery." But he contends that, even with all the benefits conferred on woman by the irregular interposition of the courts of chancery, "her legal condition is honorable neither to the generosity nor to the good sense of that sex which alone exercises the right of establishing laws." In particular he takes exception to the iniquitous disposition of married women's property, and to the absurd mixture of masculine and feminine responsibility in cases of complicity in crime. Not only are the writer's views on these topics exceedingly liberal and reasonable, but the causes of the iniquity complained of are indicated with a sagacity which reminds the reader occasionally of the investigations of Sir Henry Maine. He alludes to the deification of woman in primitive Greece—to the female deities, Rhea, Juno, Proserpina, Venus, Minerva—as indicating the respect paid to the sex by these people, and cites Andromache and Penelope as beautiful examples of conjugal truth and virtue. Of course, he affirms that "Christianity proved infinitely efficacious in elevating the character and condition of woman"; but the drift of his exposition is to show the prevailing influence of intelligent customs under rational civilization.

The attentive study of these two articles has impressed us deeply with the essential earnestness of Mr. Cushing's mind. In quality as well as in quantity, in depth as well as in fluency and swiftness, he was remarkable. Had he been less universal, he would have been more famous. The variety of his gifts was against his popular influence. The old New-Englander can not easily disabuse himself of the belief in Mr. Cushing's alleged tergiversations and political infidelities; but local prejudices are temporary, after all, and substantial qualities of mind stand vindicated at last. If what Faraday said is true, that "in knowledge that man only is to be contemned and despised who is not in a state of transition," Caleb Cushing has nothing to fear from the judgment of posterity.

Of the six men our space allows us to describe, the most copious contributor to the "Review," next to Mr. Cushing, was George Stillman Hillard. His articles number twenty-two, and are on diverse themes—law, education, history, literature in many branches. Literary subjects were clearly his favorites. He was essentially a literary man, and a literary man of a rare mold—cultivated, scholarly, elegant, studious, hospitable, sympathetic, a lover of books, accomplished in language, enthusiastic yet clear of appreciation; his place is among the refiners of American taste. From the first

he gave promise of intellectual distinction, as a student at the Boston Latin School and at Harvard College. His mental accomplishments admirably qualified him to teach at the Round Hill School at Northampton, and dictated the choice of him as the first Dean of the Boston Latin School. His associates were, from first to last, the most brilliant intellects of his day. His Phi Beta Kappa oration, in 1843, on "The Relation of the Poet to his Age," was an event in the history of academic addresses. We recollect well the effect produced by the finished periods, the graceful delivery, and the fine intellectual enthusiasm, on the throng that crowded the church in Cambridge when the effort was made. In 1847 the genius again broke forth in twelve lectures on Milton, delivered in Tremont Temple, before the audience of the Lowell Institute.

Though educated for the law, the companion of lawyers, and to some extent a practitioner, his taste was for elegant letters. His extensive acquaintance with books and his loving appreciation of them came out on all occasions, and in every form of expression; in affluent and brilliant conversation, correspondence, newspaper and magazine writings, interest in young authors, and veneration for the classics of all nations. He was a diligent reader and an accurate master of style. A sensitive organization rendered him delicately appreciative of the finer aspects of all questions, confining him rather to the æsthetic side of problems. That he was no reformer, in the harsh, aggressive sense, need not be said. He was not born to thunder and lighten, and beat evils down to the ground, but his nature revolted against inhumanity, and his heart was always on the side of mercy. In the terrible days of the Fugitive-Slave Law excitement, when the opinions to which he was most sensitive were on the side of what was deemed oppression, fugitive slaves found refuge and shelter in his house. The situation of the African race in America excited his deep commiseration, and, though he struck no blow in their behalf, he did his part to create the humaner sentiment which ultimately decreed its emancipation.

We have not space to dwell on Mr. Hillard's literary performances. We can not even name the works of his diligent hand. His biographical sketches were vivid and lifelike. His edition of Spenser had a high reputation. His "selections" from Landor gave to that powerful but eccentric writer a certain vogue, and revealed to a heedless world some of the wonders and beauties of his style. The "Six Months in Italy" was for many years the very best work of its kind, and still holds a place among the most valuable. Numerous

literary and official addresses attest the extent of his mental reach and the richness of his mental endowment. School-books, containing choice gems of literature, raised the standard of rhetorical excellence in the places of public education. His fine touch may be felt everywhere, in illustrative record and criticism. But what we desire especially to note is the unerring sagacity of his literary judgment, as displayed in the pages of the "Review." Two contributions, in particular, show this—a review of Lowell's "A Year's Life," in 1841, and an article on Mrs. Browning's "Prometheus Bound" and "Seraphim," in 1842. It may seem a thing not at all remarkable that a critic of the smallest pretension should discern the merits of poets so striking in power as Mrs. Browning and James Russell Lowell, whose fame has penetrated to every class of readers. But to pronounce a verdict on writers entirely unknown by literary report, writers of a new school, and a school of marked peculiarities, is no easy task; and to pronounce a verdict which subsequent judgment will sustain, implies perception of no mean order. And this is what Mr. Hillard did. His recognition of the newly revealed genius is as hearty as could be desired; and his criticism is as firm as it is frank.

Mr. Hillard was one of the earliest scholars in German. It is a surprise to read, in 1842, so nice a translation as the following of Heine's "Pine and Palm":

> Where polar frosts are sharp and long,
> A single pine-tree grows.
> It sleeps; and winter round it weaves
> A robe of ice and snow.
>
> Its dreams recall a lonely palm
> That, far in Eastern lands,
> By crags that glow with tropic heat,
> In mourning silence stands.

The contributions of BAYARD TAYLOR, the last of our friends, deceased, number but two, and these short literary notices merely; one a review of Swinburne's "Laus Veneris," the other of the poems of Fitz-Greene Halleck. They are characterized by the manly, hearty, honest, rather bluff qualities of the writer's mind, and give evidence of his homage to the literary art, but otherwise are not remarkable. Mr. Taylor was a workingman in letters; not a genius, not an artist of high rank; but a patient, persevering, loyal, and devoted student in literature; ambitious and self-asserting, but single-minded,

pure-hearted, and lofty of aim. From the beginning to the end, always and everywhere, he was the man of letters, consecrated to the task of putting into literary form the observations, experiences, emotions, and aspirations of life. His ideal artist was Goethe, whose calmness he sought to attain, whose universality he aspired to emulate. He never forgot that he was an author—author by profession, not from necessity, but from love of the craft. As a traveler, he had a thought to note down what he saw, in letters and books, and he was untiring in his diligence to master everything that went to make his letters and books worth reading—languages, historical facts, local peculiarities, national traits, antiquities, arts, the influence of institutions and men. His method was rather the method of painstaking labor than of quick insight. On one occasion, after listening with great interest to a lecture on Moscow, a hearer said to him that his method recalled a visit he had made, a few days before, to the studio of Church, who had on his easel the celebrated picture of Niagara. The painting was considerably advanced, and the visitor put to the artist the obvious question, "How soon will the work be finished?" The artist measured the canvas with his eye, and quietly said that, at the rate of his proceeding, so many days in the week, so many hours in the day, the picture would be completed in about two weeks. He worked steadily, gaining ground inch by inch, and was certain that, if each detail was conscientiously executed, the final result would be harmonious to the eye and true to nature. Mr. Taylor was struck and gratified by the comparison. "Yes," said he, "that is the way. Put the parts together, and you make the whole." But this is not the way of genius; and genius, it is commonly allowed, Mr. Taylor had not. He may have had what was more serviceable, but he had not that.

The translation of "Faust" tells the story. It is a remarkable literary achievement, a wonder of accomplishment. The second part of the poem, especially, is a miracle of patience, fidelity, and loyalty to the original master. He might have evaded the responsibility of turning it into English. He might have pleaded the difficulty of the task, its unprofitableness, its thanklessness. He might have echoed the disrespect in which that portion of the poem was held by critics and admirers of Goethe, in his own country as well as elsewhere. But no; the task of translating the drama had been undertaken, and must be performed unflinchingly, cost what it might in time and toil. Goethe had written it and sent it forth, and no loyal friend of Goethe would slight it.

For reputation, influence, support, happiness, Mr. Taylor resorted to literature. It was the occupation of his time, his recourse in strength, his solace in loneliness and depression of spirits. His books were his joy and his crown. He lived in and by literature; literature, in whatever form it presented itself—journalism, lecturing, poetry, fiction, the making of books. Though resolved to do his full and exact duty to the Government that sent him as minister to Germany, his deep-seated purpose was to write the life of the man whose genius he so much revered. The literary ambition filled his heart, and made him all but insensible to the public honors that were heaped upon him.

He was not an aristocrat in literature; he was, however ambitious and soaring, content to be a door-keeper at the house of that supreme monarch of art. He was a servant, often a day-laborer, doing drudgery, unwillingly but still proudly, lamenting that the vocation of the man of letters was no more respected, but determined, for his part, to hold it in supreme honor. He would have appreciated, had he been alive to witness it, the tribute paid by the printers of Leipsic to the man who had himself been a printer.

He had the conservatism and the radicalism of the man of letters. He knew how slow and toilsome was the progress of literary art, and, from reverence of soul, forbore to smite the creations of the human intellect, which represented so much patient labor. But none knew better than he the force of thought to pulverize systems, and the necessity of opening a way through institutions for new thought to flow. His "Masque of the Gods" and "Deucalion" were attempts to express in poetic form philosophical ideas at once destructive and constructive—ideas born of the most audacious speculation, and yet fraught with reconciling and healing virtue.

Such, in our judgment, was Bayard Taylor. Unlike any of those that have been spoken of in connection with the "Review"—so unlike them, one and all, as scarcely to belong among them—yet their brother in spirit and in labor, one of the men who have given dignity and beauty to literature in America.

O. B. FROTHINGHAM.

V.

A PLEA FOR SPORT.

THAT exercise is the primary condition of vigorous health, whether of body or of mind, is a truth underlying every rational scheme of physical or intellectual culture : the most valuable acquisition of a course of schooling is, not the knowledge that we gain, but rather the mental discipline, and the development of our faculties ; and the greatest good to be derived from bodily exercise is, not so much the increased strength and agility, as the improved tone of the whole system. Further, our physical and our mental states have a reciprocal action upon one another, and a man can not be said to possess *mens* perfectly *sana* unless he at the same time enjoys *corpus sanum*. The ancient Greeks and even the Romans, however defective their knowledge of physiology may have been, appear to have had a singularly clear conception of this truth ; and the importance attached, more particularly by the former, to bodily exercise as a necessary part of a youth's education, shows that they had a truer and a more adequate idea of the nature of man than most of our modern educators.

We hear a great deal of declamation about the dignity of labor. We propose to say something about the dignity of play. And, as the social position of a man is oftentimes determined by his supposed descent from some historical or legendary personage, it will perhaps dignify our modern games and sports if they can be shown to trace their pedigrees back to the games of ancient Greece and Rome. The Latin biographer, Cornelius Nepos, would fain apologize to his Roman patrons for mentioning, in the life of Epaminondas, among the accomplishments of that great general, that he was a graceful dancer, and that he excelled as a player of the flute. What may in one country be perfectly decorous, will in another be considered unbecoming, says the historian ; we make the same apology, if apology is required, for tracing back to Grecian antiquity the

child's play of "riding a stick"—a form of amusement which Agesilaus and Socrates did not disdain to practice. Whether the boys' game known to the Greeks under the name of *chytrinda* was "hot cockles," as Strutt contended, or "frog in the middle," as Arbuthnot held it to be, is of little importance, though the two scholars very nearly came to blows in discussing the question. It is sufficient for us to know that these familiar plays of modern English boys had at least an analogue among the ancient Greeks. We have it on no less authority than that of the father of history that ball-playing was practiced by the Lydians before his time. In Homer we see the Princess of Corcyra and her handmaidens beguiling their idle moments with this sport. Indeed, there are few of our popular games and sports which have not their more or less exact counterparts in classic antiquity; of many of them traces are said to have been found even among the relics and monuments of prehistoric man—in the cave-dwellings of France, the lake-dwellings of Switzerland, and the mounds of our Western States.

Our holidays, too, have their counterparts in the ancient time. The observance of New-Year's-day and many of the usages connected with it are reminiscences of the Saturnalia of the Romans, which occurred at about the same period of the year. The license of All-Fools'-day is also a survival of the extravagance permitted during the Saturnalia, when all social distinctions were for the moment in abeyance. The observance of May-day, the Roman *floralia*, or festival of Flora, is another link connecting our modern civilization with that of ancient Rome. And it is worthy of note how intimately associated with religion were all those festivals of antiquity. Christianity preserved this association of popular amusement with religious observance, simply substituting for the gods and heroes of Greek and Roman mythology the hardly less mythical worthies who figured in its own early history. Too often these semi-religious festivals degenerated into occasions of debauchery and licentiousness,* but for all that we must recognize the wisdom of the ancients in seeking to dignify with religious associations the sports and pastimes of the lower orders of society.

From Rome we derived the original of our civic jurisprudence. So, too, the religious institutions of Rome have had a potent influence in determining the historic development of Christianity. But Greece was the birthplace not only of the fine arts, but also of sys-

* 1 Corinthians xi. 21.

tematized physical culture. Athletic exercises were always held in the highest honor in Greece; the different games, as the Isthmian, the Olympic, etc., were events of the highest national importance, as is evidenced by the custom of reckoning time by Olympiads, that is, the intervals of four years between the regular celebrations of the Olympic games. It is as though we were to reckon time according to the occurrence of our international industrial exhibitions.

What a contrast to all this is presented by Egypt, that land of bricks without straw, over which the rock-hewed Sphinx, staring eternity out of countenance, keeps watch and ward as she scornfully looks down upon human desire and pitilessly mocks at the vanity of human wishes! Baptized in the blood and bathed in the sweat of slavery, she is a monument of unrecompensed labor, and with her ponderous weight has effaced all semblance of joy from the land over which she broods. Whatever the cause may have been, whether the propinquity of the bleak and silent deserts, or some baleful strain of melancholia in the race, or some unexplained climatic influence, it so happens that Egypt has ever been a land enshrouded in gloom, knowing nothing of the joy of life.

The Olympic games, first instituted in honor of a local deity, in the course of time drew to themselves competitors eager to enter the lists from all the surrounding states of Hellenic origin. That three of the most illustrious champions in these games had altars erected to their memory in the Olympian Plain, and that worship was paid to them as to gods, is evidence of the high estimation in which athletic prowess was held among the Greeks. Athens showed her approval in the more practical shape of an award of five hundred drachmas to her successful athletes; while Sparta rewarded her Olympionikai by assigning them to the post of danger and of honor in battle. They were her Legion of Honor.

No man was permitted to contend for the prize in the Olympian games unless he was of pure Hellenic blood, a freeman, and of good report. Athletes flocked to enter the lists from the distant colonies in Asia, northern Africa, and the West. Our modern contests of marksmanship may serve to give us some idea of the emotions excited on the *quadrennial* recurrence of the Olympic festival. The arts too—architecture, sculpture and painting—contributed toward making the scene of these games in every way worthy of its world-wide renown. Of the many temples erected in the sacred grove of Altis was one designed by the architect Libon; it was a fitting shrine for Phidias's masterpiece—the seated statue of Zeus Olympius wrought

in ivory inlaid with gold. This temple, ornamented with the finest sculptures and paintings of that day or any day, and rich in votive offerings from states and individuals, must eventually have become a veritable museum of Grecian art.

With the decline of Greece consequent on her subjugation by the Romans came the downfall of her national games. Her noble statues, her venerable temples, her ivory gods, remained standing for a time, as though in mockery of her fallen state. Her priceless treasures of art were carried as trophies to Rome, and henceforth Greece was only a memory. Grecian ideas, however, were immortal, and quickly leavened the Latin mind. Grecian philosophy, Grecian sculpture and painting, Grecian poetry, found sincere admirers and imitators among their less gifted conquerors; and to this day the influence of that wonderful Hellenic civilization is felt throughout the world.

Transplanted to Rome the fine arts found no congenial soil, and the same is to be said of the gymnastic art of the Greeks. The inborn lust of magnificence peculiar to the Romans, their love of barbaric display, no doubt led to greater splendor of decoration in their amphitheatres or gymnasia; but the gymnastic exercises of the Greeks were never fairly naturalized among them. A bull-fight, a death-struggle between a man and a wild beast, a bloody encounter between gladiators—such were the scenes which delighted the Romans; slaves, condemned malefactors, the offscourings of the population, were the combatants in the Roman arena. The successful combatant was never honored, nor indeed deserved to be honored, as was the winner in the Olympian games. Instead of being a means of developing physical grace and strength, these contests in the amphitheatres served only to brutalize the Roman people. So far indeed were these exhibitions from diffusing among the people a love of gymnastic exercises, or developing manliness and self-reliance, that they in fact became in time one of the principal instruments of their enslavement. When, by largess of their emperors, they had provided for them "panem et circenses"—food and shows—they cared for nothing else, and suffered their most precious liberties to be taken away. The amphitheatre ministered to the debasing passions of the multitude, and instead of being an agent of civilization, as it undoubtedly was in Greece, became a means of still further developing the natural ferocity of the Roman character. Nor was it the ignorant populace alone that enjoyed the wholesale slaughter of the arena; the highest order of society, the magis-

tracy, the senators, the patricians, the men and women of the fashionable world, thronged its benches and stalls, and by their presence and their plaudits encouraged the butchery. The limits of this article will not permit us to give a detailed account of these Roman games, nor indeed would such account in any wise serve to add force to our plea for sports. From the outset these games had been conducted on erroneous principles, and in their time of decay they contributed in no mean degree toward the disruption of the Roman Empire itself.

On the invasion of Italy by the barbarians, the amphitheatres of Rome suffered a fate analogous to that which had befallen those of Greece under Roman domination. The Romans adopted as their own the national games and sports of the Grecian states, and carried away to their homes whatever was portable in the shape of works of art. The barbarians, to repay a long score of wrong suffered at the hands of the Romans, wreaked their vengeance on the amphitheatres, but the games and sports, being congenial to their rude and martial natures, they preserved. From the Romans, whose empire they swept like a destructive tidal wave, the barbarians received their first lessons in art, science, and polity; but surely these were not their earliest acquisitions. They would be more apt to adopt first those usages and customs which they could most readily understand and appreciate. And, if the barbarians, from a natural inclination in the first place, adopted the sports and games of the empire they had overrun, they would retain them and introduce them into every province which yielded to their victorious arms.

Undoubtedly the love of sport is innate in the human breast, like the love of glory, supremacy, ostentation, and other passions; but these passions are capable, on the one hand, of being nurtured, and, on the other hand, of being checked or suppressed by the action of individuals or nations. Did not the French Revolution—great and beneficial as were its results—encourage, during its continuance, the love of license, and was not that disorderly passion transformed by the overmastering individualism of Napoleon Bonaparte into the love of glory? Again, the Turks, if they have not eradicated from their race the love of alcohol—a propensity so deeply seated in the human heart—have at least checked its general indulgence within their realms.

Whithersoever Roman domination extended, at least wherever throughout the vast empire they established *coloniæ* or *municipia*, there also we find the ruins of their amphitheatres, which are even

more conspicuous than are the traces of their admirable roads. These provincial amphitheatres were simply copies, some of them on a grand scale, as that at Nîmes, for instance, of the great amphitheatre in Rome. Hence, wherever the barbarians settled they had almost invariably thrust upon their notice the Roman games, as at Verona, Puteoli (Pozzuoli), Pola, Arelate (Arles), Augustoritum (Limoges), and other places too numerous to mention.

Even before the barbarians came as conquerors, their ancestors had had experience of these same amphitheatres by having often "served to grace a pomp or deck a Roman holiday"; consequently our rough sports, such as bear-baiting, cock-fighting, prize-fighting, tilting, and the like, as well as the now obsolete joust and tournament and other knightly amusements, believed by some to be the product of the middle ages, are in reality only barbaric modifications of the sports of the Roman amphitheatre, while these Roman games were themselves only a very rude copy of Greek originals. The middle ages—the outgrowth of the barbarian invasion of the Roman Empire—simply transmitted these games in a modified form; they did not originate them. The Spanish bull-fight is an instance of the adoption and modification by the barbarians of a Roman game, and here we can distinctly trace the Roman origin in spite of the purely Gothic *mise en scène*. But Latin sports are not restricted to the peoples commonly but erroneously designated as of Latin blood. Beyond a doubt a clearer pedigree could be established for most of our present pastimes, and they could be traced back to the Norman invasion of Britain with far more certainty than could many a patrician family in England, whose boast is that their founders came over with William the Conqueror. This was an indirect acquisition of Roman games, but, for all that, it goes to confirm what has already been said, namely, that our modern games are mostly derived from the ancients. Probably, too, the games brought in by the Normans gave a new impulse to many which may have remained after Britain had ceased to be a Roman province.

And the same reasons which made the Roman games so acceptable to our barbarian ancestors availed to commend to their imaginations Roman art. Grecian art was too refined, too ideal, to make a strong impression upon the barbarian mind; Roman art was not altogether beyond their comprehension, and so it became a potent agency in the work of civilization. The masterpieces of the old Italian sculptors and painters, headed by Michael Angelo, prove that they too copied more the trained Roman pugilist or gladiator

than the symmetrical Greek athlete ; for, in piling great masses of muscle on every available square inch of their subjects' frames, they show that they were impressed by power rather than by beauty ; and herein they offer a striking contrast to the masters of Hellenic art.

Again, our political institutions and our discriminations of social rank retain many plain evidences of the barbarism of the middle ages, and possess too little of the graceful simplicity of Greece. The very names by which modern Europeans designate the different orders of the social hierarchy indicate their Roman origin ; for in the titles of *princes, dukes, counts*, and the like, the roots of the words are unmistakably Latin, and argue much for the birth of the system. The form of despotism known as *Cæsarism* needs no comment ; while in literature, fiction, under its earlier name of *romance*, plainly indicates its Roman source. In our punishments, too, until very recently, a Roman severity was most conspicuous. Notice even to-day the unspeakable horrors of a capital execution, and compare it with the account of Socrates calmly drinking the hemlock, and peacefully gliding into the great unknown. But, since the vast political and social convulsion of the last century, the rights of man have superseded the rights of kings, and in the larger humanitarianism of the day our rough and cruel customs are being cast aside, or at least toned down. This influence, we think, has been especially felt in our amusements, and it will continue to extend. The French Revolution taught us to look back to antiquity, and we have so far improved by the lesson that we are no longer satisfied to look only to Rome for inspiration.

With the growth of a purer civilization we are becoming more Grecian in our ideas and sentiments. Our every-day life, while it grows more complicated in its relations, is assuming more and more of Grecian simplicity in outward forms, as in government, style of dress, and modes of living. We are becoming more austere, Puritanical in externals, but more catholic in the complexi of our mutual relations. We have ingrafted on classic times the steam-engine, the telegraph, and the telephone, whose result is the progress of the nineteenth century. All our inventions have for their end economy of time—rapid transmission, whether of speech or of body, of matter or of mind. Dispatch, not exquisite artistic finish, is the demand of the hour ; and in this respect, perhaps, do we differ most essentially from all preceding ages. But nevertheless our power of execution, increased though it is a thousand fold by our innumer-

able mechanical contrivances, is laggard compared with our eagerness to overmaster space and time. We demand of the engineer that he transport us from place to place with the instantaneousness of magic. The sensor nerves of the telegraph must connect us with every remote point on the habitable globe, and we must be hourly informed of every trifling occurrence that takes place all over the earth. But, in the bustle and excitement of our multitudinous concernments, little time is left for recreation or relaxation of any kind, though the necessity for relaxation is greater the more engrossing our occupations become.

How are the demands of our physical and mental constitution to be reconciled with the exactions of modern life? Here the inventor again presents himself with his time-saving devices. The preservation of health and the rapid acquisition of physical vigor are made the subject of scientific experiment, and Indian clubs, health-lifts, and patent rowing apparatus have been introduced, which, if their contrivers are to be believed, will, by a few minutes of daily practice, do more to develop muscle and give healthy tone to all the bodily organs than would as many hours devoted to less scientific forms of exercise.

But these modern patent appliances for concentrating the greatest possible amount of physical exercise into the fewest possible moments of time are open to very serious objections indeed. First, they are extremely monotonous—they are of the treadmill order. Even if they were beneficial in their results upon the development of the muscles, the daily use of them must be as distasteful as a daily dose of Epsom salts or castor-oil. But the same objection lies against "condensed exercise" which lies against condensed articles of food. Neither is quite wholesome. When the article can not be had in the natural state, the concentrated preparations may serve as a substitute for a time, but continued use of them will infallibly derange the system. So, if a man can not have the natural forms of physical exercise—a brisk walk, a ride on horseback, an hour's rowing on the water—the Indian clubs or the "pocket gymnasium" will be better for him than nothing; that is all that can be said in their favor. Another objection which has been urged, and we think very justly, against certain "patent" modes of exercise is, that by crowding the maximum of exertion into the minimum of time they subject the organs of the body—the heart and the various blood-vessels particularly—to undue strain, and hence are highly dangerous. These methods of exercise may be shown to be fallacious by

the *reductio ad absurdum*, for, if they are correct in principle, then, by employing a chair as a hobby, and by leaping over tables, we could derive all the healthful and pleasurable excitement to be had in cross-country riding.

The sports of the field, in spite of all that can be said in their favor—and they have always deservedly been held in the highest estimation—seem to be inevitably doomed by the gradual extermination of game before the steady advance of civilization. Game laws may tend to preserve it; but will the encroachments of democracy allow those laws themselves to be long preserved? The wide domain over which the American bison used to roam is said to be contracting at the rate of over one hundred miles of area per year, while the wholesale slaughter of smaller game is rapidly exterminating the feathered inhabitants of our woods and prairies. Laws have indeed been enacted for their protection, but practically they are a dead letter, and so in all probability are destined to remain.

Sports of the field in old and populous countries are a privilege of the aristocracy; requiring artificial means and restrictive measures for their indulgence, they can be enjoyed only by the comparatively wealthy few. The case is different with games of competition. These are inexpensive, and naturally as little subject to the operation of the law of preserves as the air of heaven itself; hence their eminent fitness for popular amusements. It is for this reason that, as our political and social institutions become progressively more democratic, popular games will usurp the throne vacated by the sports of a privileged class. Muscular Christianity will in this way be developed from the muscular heathenism of antiquity. These games of competition are as yet practiced only by comparatively few, but we hope that before long their benefits will be recognized and enjoyed by all. Relaxation should be not the privilege of the few but the right of the many. Like many of the minor luxuries—such as tea, coffee, tobacco, which not very long ago were so costly as to be obtainable only by the comparatively wealthy—healthful physical exercise, which is of prime necessity for health, must be placed within the reach of all classes of the people. The state now insures to all children within its jurisdiction a sound elementary education; and this it does because it recognizes in ignorance one of the more serious menaces to its own integrity. But of no less importance is it to the state that all of its citizens should be physically vigorous, for on physical power depends its security against the attacks of foreign enemies. For this reason the state

should in every available way encourage all forms of health-giving bodily exercises among the people; and we confidently look forward to the time when the toilers in the mines, as well as the mechanics in the cities, will daily exchange the polluted air of the scenes of their labor for the invigorating atmosphere of heaven. Then will his hours of toil become not only less irksome to the workingman, but even more remunerative to his employer. We live in an age of sharp competition; and, if we would achieve more work than others, it behooves us not to disregard this truth: so shall we be better workers, and, what is no less important, happier men.

The direct, immediate benefit derivable from physical exercise in the open air will be readily understood when we consider a few elementary facts of physiology. If we suppose the amount of air taken into the lungs during a given time while the body is recumbent to be represented by unity (1), then by simply changing the recumbent for the erect position the quantity rises to one third more (1·33). Walking at the rate of one mile per hour adds but little to this last quantity (only 1·57); but walking at the rate of four miles per hour involves the inhalation of air exactly five times as great as that inhaled in the recumbent position.

Of course the amount of impure air inhaled by those whose occupations lie indoors can be calculated with equal accuracy. The quantity increases in proportion to the physical exertion which their employments require. It is for this reason that the open playground is to be preferred to the inclosed gymnasium, though the latter class of institutions have much to commend them. In Germany, since the great revival of gymnastics early in the present century, and since gymnastic exercises were made obligatory in the army, not only has the stature of the soldier been visibly raised, but longevity has been materially increased. The benefits of regular gymnastic exercises are forcibly expressed, and the errors to be avoided distinctly pointed out, by Dr. Austin Flint, Jr., in the following passage: "If properly directed," he writes, "gymnastics will enlarge and strengthen the various muscles of the trunk, neck, arms, and legs, will expand the chest so as to facilitate the play of the lungs, will render the joints supple, and will impart to the person grace, ease, and steadiness of carriage, combined with strength, elasticity, and quickness of movement; but an injudicious mode of exercise will frequently confirm and aggravate those physical imperfections for which a remedy is sought, by developing the muscular system unequally."

It is even yet often urged that in the athletic rivalry of our colleges a man's muscles are trained and developed at the expense of his brains, and we are invited to look at the professional athlete for an illustration of the results which this devotion to physical culture is likely to produce. The professional athlete as he exists today is, we admit, very far from the ideal standard of manhood as regards mind, but a sufficient reason for that fact is found in the pressure he is under of bestowing all his efforts on the development of the merely animal side of his nature. He is a specialist, and the specialist is *ipso facto* always unequally developed. Nevertheless, even the mere athlete has his uses, and the chief one is this, that he shows us to what a height of perfection our bodily powers may be carried. But we know that even the professional athlete is not of necessity *only* "a splendid animal." Among the ancient Greeks, as we have seen, the athlete was held in very high honor, and we may be sure that so highly intellectual a race as the Greeks would not bestow such eminent distinction on men who had nothing to commend them but their muscle. Indeed, we know that men of the very first note among them—philosophers, poets, artists—were victorious athletes. If Chrysippus and Cleanthes, Pythagoras, Plato, and Alcibiades did not disdain to "contend for the mastery" in the Grecian games, the youths in our colleges need not fear that by following those illustrious examples they will be doing anything inconsistent with the character of a student or of a philosopher. Our universities and colleges are, indeed, only conforming themselves to the practice of similar institutions in ancient Athens, when they establish gymnasia within their precincts, for it was in the gymnasia of the city that the Athenian philosophers were wont to deliver their lectures to their pupils. Hence the origin of the name to this day applied in Germany to the high schools—gymnasia.

Plato and Aristotle were both of the opinion that no republic could be deemed perfect in which gymnasia, as a part of their national establishments, were neglected. Of course, under the term gymnasia, we must understand all sorts of healthful physical exercise. The *sanior pars populi*—the cultivated minds of a nation—will be but ill fitted to exert any powerful influence on the less enlightened minds of their fellow countrymen, unless they possess a certain degree of physical vigor. Unless their nerves and muscles have been hardened and trained in the school of bodily exercise, the more will they lack the energy that is needed to govern men, and that consciousness of strength without which no one can be a leader

of men. If our best citizens are dyspeptics, our worst subjects will rule the republic. Hence it is the dictate of patriotism that we should encourage such popular games as tend to develop a vigorous *physique.*

Let us, therefore, have provided in every educational establishment in the land ample facilities for out-door exercise, where the youth of our country may not only acquire muscular vigor, but where also they may be trained in the practice of the manly virtues of truth, honor, and fair play. The physically weak have to resort to *finesse*, chicanery, duplicity, to hold their own against their stronger competitors; the physically vigorous are wont to assert and maintain their rights after a more manly fashion, and the latter are always the victors in the end. The avoidance of all unnecessary physical exertion—the result in a great measure of enervating climatic influences—may be assigned as one of the principal reasons why Asiatics, when opposed to Europeans, have invariably gone to the wall, from Xerxes' time down to the present day. The inhabitants of mountainous districts appear to be superior, both in morals and in bodily development, to those dwelling in valleys, mainly because they have a sharper struggle for existence. They are, by the very necessity of their situations, more active, more self-reliant, more austere in their mode of life, more inured to hardship. It is in such habits as these that the highest and most heroic virtues have their root.

Having thus far endeavored to point out the physical and moral benefits accruing to the individual and to the community from the practice of open-air sports, it remains to consider the matter in its political aspect.

From and even before the day when Menenius Agrippa likened the agrarian uprisings at Rome to the rebellion of the different members against the stomach, society has been agitated by fears of communism in one form or another, and all sorts of repressive measures have been tried against it, from the bludgeons of Pisistratus to the bayonets of Napoleon. Argument, too, has been tried, but with no better results. Since logic and force have proved unavailing, we venture the suggestion that perhaps a more general indulgence in some species of national games might go far to lessen if not quite to nullify the danger, for these games appear well fitted to act as safety-valves of the governmental machine. They might become effectual antidotes to the subversive theories put forth by mad enthusiasts, whose disordered imaginations are only the natural result of living in a poisoned physical and moral atmosphere. The

true medicine for a mind diseased by having been inoculated by this moral poison is sunlight and abundance of pure air! Conspiracies against the commonwealth are not planned in the cottage of the peasant; they are hatched in the crowded tenements of great cities, for they are the homes of glaring vice and abject poverty, whose legitimate child is Discontent. Paris cherishes the viper of revolution in her bosom, and, though it often stings her, she still fosters it; while the great capitals of Europe are the nests of insurrection. Paris rules France, but England governs London, and it is no doubt by reason of this fact that in the latter city communistic or socialistic theories have as yet made little progress.

As a means of uniting the different classes of society in bonds of friendship, of reconciling the poor to the apparent injustice of social order as it exists, and of exorcising the demon of discontentment, exercise, in the shape of popular games, is of the greatest advantage. In their open competition they teach a man to respect his neighbor's efforts. They show him that there is no such thing as luck or fate, and that what a man is to be depends very largely on his own strenuous industry, watchfulness, and self-control. Surely, if the general introduction among the people of games and sports could inculcate that lesson on the mind of every man, they would confer an inestimable benefit upon society.

And that these games of competition have this effect is undoubted. In every British regiment it is customary for "scratch teams" of cricket-players to be formed indiscriminately of officers and private soldiers, perfect equality being maintained in the field. British military discipline has not suffered by this temporary effacement of the distinction of rank. College menials at English universities, in like manner, contest with undergraduates in a common ground. The result in both these instances is, a better feeling between the different classes. We may be sure that aristocratic arrogance and contempt for men of inferior social rank can not long survive under such conditions. On the other hand, the menial or the private soldier finds his self-respect increased, his ambition stimulated—in short, he comes to see that indeed

> The rank is but the guinea stamp,

and that, unless intrinsic worth underlie it, rank only makes a man more contemptible.

The stability of England is insured by her liberal peers and her conservative commoners, and she is the only country in which this

seemingly paradoxical state of society exists. Is not the healthy tone of English political life in a great measure the result of the cultivation of sport by the upper classes, and of the competition of the different classes on a common ground, whether it be the hunting-field or the cricket-green? Had Bismarck guided the restless spirit of the German nation out of the path of war into the peaceful channels of competitive games, there would be less occasion for the present restrictive measures against the Socialist Democrats. If the Russian student were encouraged to devote his superabundant vitality to physical exercise, he might become less of a political visionary, and then there would probably be no need of closing the universities; while, if the entire people had some form of national games, they might cease to be the "empire of the discontented."

As a means of bringing the family of nations into more friendly relations, international athletic contests have within a few years proved to be very effectual. The Anglo-American boat-race, it may safely be affirmed, contributed in a greater degree toward inspiring both nations with mutual respect, and dissipating petty jealousies, than did the much-lauded principle of arbitration, as exemplified in the settlement of the Alabama claims, or in the fisheries award. And like manifestations of good will, mutual regard, and high courtesy have been made in every one of these international contests, whether held here or in the mother country. The proposed polo-match between England and America can only tend, though in a limited degree, perhaps, to strengthen the amicable relations between the two countries. And when the assured victor in the last international walking-match "coached" one of his antagonists, and encouraged him to persevere, he set an example which diplomatists and plenipotentiaries would do well to imitate. Surely our modern public games are not unworthy of their descent from the games of ancient Greece; nor is it altogether visionary to expect that the time will come again when the successful competitor in these contests will receive honor from his fellow citizens comparable to that paid to the Olympian victor "whose native city was considered as ennobled by his success, and who was himself considered sacred. He entered the city through a special breach made in the walls; he was supported at the public expense; and when dead was honored with a public funeral." We are far from thinking it desirable to revive these customs of the ancient Greeks; we simply recommend the spirit in which these high honors were conferred.

If in these few pages we have not proved that the Godolphin Barb's progenitor was tethered in Diomede's stable, or put in training for the Olympic course; if we have failed to show that the American trotter's sire was ever harnessed to a Grecian chariot, we trust we have at least demonstrated that games and sports are of very high importance, morally, intellectually, and physically. Of one thing there is no doubt, that they are a means of bringing the different classes of society amicably together, and of affording to the masses a welcome holiday with rational and healthful amusement, and this is one of the greatest needs of the time.

LLOYD S. BRYCE.

VI.

NOTES ON RECENT PROGRESS IN APPLIED SCIENCE.

THE science of to-day, like everything else, material or intellectual, is the child of the past, and our latest discoveries owe their very being to the old and almost forgotten labors and achievements of the earlier ages; just as the earth of to-day owes its present condition and capacity for sustaining the complex existence of modern civilization, with all its refinement and beauty, to the long history of change and development beginning with the original chaos and passing through the periods of monstrous vegetable and animal life, of tree-ferns and of saurians, and the other eras of geologic change, and coming down through the dark ages of barbarous human development to our own time.

As one of our poets very beautifully expressed this idea:

> What fiery fields of Chaos must be won,
> What battling Titans rear themselves a tomb,
> What births and resurrections greet the sun,
> Before the rose can bloom!
>
> And of some wonder-blossom yet we dream
> Whereof the time that is infolds the seed,—
> Some flower of light, to which the rose shall seem
> A fair and fragile weed.

In consequence of this, it is hardly possible to describe any new development without large reference to the old foundation on which it is built, or the old material out of which it is formed.

Progress in Electric Science.

Thus the most remarkable and striking developments of late have been in subjects involving the principles of electric induction

first brought to light by Faraday in 1831. The Bell telephone and the electric light of to-day are the direct applications of the principle first announced by Faraday in 1831.

A few words as to this principle and its connection with these applications will, then, come in good place, not only to make clear the latest developments in these directions, but also to prepare us for the next steps which may perhaps be taken before this present writing can reach the eye of its readers; for so rapid is this progress that it even outstrips the marvelous rapidity of the compositor and the power-press.

In brief, then, this important principle is this: Whenever a conductor, such for example as a copper wire, is moved near a magnet so as to cut those directions in which iron filings arrange themselves about the poles of a magnet, and which are often called "lines of magnetic force"—whenever, we say, a conductor cuts these lines, a current of electricity is caused to flow through such a conductor. It is evidently immaterial whether the conductor is moved across the lines of force of a magnet at rest; or, the conductor being at rest, the magnet with its lines of force is moved in reference to the conductor; or, lastly, whether, both conductor and magnet being at rest, the lines of force are caused to move in reference to both magnet and conductor. In either case lines of force will be cut by a conductor, and a current will be developed as long as the cutting or relative motion between the conductor and lines of force continues. It is this simple principle which is at the foundation of all the electric-light machines and most of the telephones now in use.

Coils of wire are made to revolve rapidly near to powerful magnets, and by this means electric currents are generated which are then used, in one way or another, for the production of light. It must not, however, be forgotten that here, as everywhere else, the great doctrine of "conservation of energy" is maintained—that doctrine which found a prophetic expression in the proverb, one of whose homely forms was, "You can not *have* your cake and *eat* it too." In other words, and with special application to this case, you can not have an electric current and also the power required to generate it.

When the current begins to flow in the conductors or wire coils, it develops in them a powerful attraction for the magnets near which they are moved, and to continue the motion a great force must be continuously applied and expended.

Thus it comes about, that to produce electric currents with these

magneto-electric machines, as they are called, a large amount of mechanical force must be applied, as for example the power of a steam-engine; and thus we get the electric current only by giving for it so much as its equivalent, of energy, which is derived from the fuel consumed in the furnace of the steam-boiler.

We are, therefore, getting the electric current at the expense of the coal consumed (making no allowance for losses), and, though this is very much less expensive than any method before known of obtaining an electric current, we would make a serious mistake if we forgot or neglected to include it in making any calculations as to the practicability and economy of electricity as a source of light or other effect.

Bearing this in mind, however, we find that recent improvements in the structure of magneto-electric machines have so developed their efficiency, that in the best forms as much as eighty per cent. of the energy applied to them is converted into electric current.

In other words, for every hundred horse-power expended in turning the machines, eighty horse-power is converted into electric force, and only twenty horse-power is wasted or lost in doing useless work, such as heating the machine itself.

Compared with other machines, this is a very wonderful performance. Our best steam-engines almost exactly reverse these figures; that is to say, our best steam-engines give us an available power of about twenty per cent. of the energy given out by the fuel burned in their furnaces, and waste eighty per cent. in heat thrown up the chimney and otherwise dissipated.

While, therefore, there is an immense margin for improvement in the economy and efficiency of our steam-engines, the magneto-electric machines have nearly reached the maximum possible of effectiveness, and any one who proposes to double their performance in this respect, either does not know what the good ones now accomplish, or does not understand the subject.

In applying the electric currents which these magneto-electric machines develop to the production of light, two principal means have been employed: first, the electric arc; second, the incandescence of a heated conductor.

The *electric arc* was first shown by Sir Humphry Davy in 1808, and is produced by interrupting a powerful electric current between two points of carbon. To accomplish this we have two pieces of carbon in contact with each other, and so connected with a galvanic battery or magneto-electric machine that the current flows

through them ; then, on separating the pieces of carbon gradually from each other, the electric current springs across the gap, carrying with it particles of carbon and carbon vapor, which make a flying bridge by which it continues to travel across.

In thus tearing off particles from one side and hurling them against the other, intense heat and light vibrations are occasioned in both poles or points, and in the flying fragments, and this is what constitutes the electric arc.

Such an arc may develop a light equal to that of five hundred or of twenty thousand candles, and is so far, much the most efficient and economical means by which electric force can be converted into light.

The best results as yet obtained show that for each horse-power expended in turning the magneto-electric machine a light equal to that of two thousand candles (or one hundred and twenty-five gas-burners) can be obtained.

A first-rate engine should not need more than three pounds of coal per horse-power per hour, so that in every case where a light of some hundreds of gas-burners in one place is required the light of the electric arc would be very economical. The difficulties which at present limit its use in this connection are the result of its great intensity and more or less unsteadiness, and the inconvenience of having a steam-engine in certain localities. Multitudes of ingenious inventors are busy devising electric lamps to overcome the former of these difficulties, and without doubt the electric-arc light will daily extend its field of illumination among our factories, workshops, and public buildings generally.

Electric incandescence, as a source of light, made its appearance at about the same time and in the same place as the electric arc, but it was first reduced to a practical shape about twenty years ago by M. de Changy in Paris, and by Mr. Moses G. Farmer in Salem, Massachusetts. Both of these gentlemen seem to have developed electric lamps operating by the incandescence of a metallic wire, and having an efficient automatic regulator by which their constancy of action was secured ; but the great cost of electricity, produced at that time by the galvanic battery, caused the abandonment of all efforts to make any practical use of such apparatus. Now, however, that a relatively cheap source of electricity is found in the magneto-electric machine, these old plans have been revived, and we find in Mr. Edison's English patents a redevelopment of the same thing.

They all operate on the fact that when a powerful current of

electricity traverses an insufficient conductor, as a wire or narrow strip of platinum, for example, the same is intensely heated, and so becomes luminous. Coils of wire, strips of platinum, or the like, are therefore so arranged that a current shall pass through them, and so make them luminously hot or incandescent. As this incandescence is greatest near the fusing-point of these substances, and their fusion would of course interrupt the action, various ingenious contrivances are adopted by which the current is automatically shut off or diverted if it approaches too near to this disastrous result. Thus, for example, the strip of incandescent metal itself so operates a lever that as soon as its expansion reaches a certain degree it closes a circuit, which diverts part of the current into another conductor.

There are a multitude of these contrivances, and almost every day sees new ones added to the list, but so far they have all been very elaborate, often complicated, and, as a rule, expensive instruments.

Another plan is to use, in place of a metal which *may* be fused, a thin rod of carbon, which can not be fused, and whose tendency to burn is overcome by inclosing it in a glass vessel filled with some gas which can not combine with it, nitrogen for example. Lamps of this nature have been largely experimented with, and inventors are still laboring upon them, but as yet the success obtained is not such as to warrant their practical introduction into actual use.

In all plans of obtaining light by electric incandescence so far published, the cost of the light has been many times greater than with the electric arc.

On the other hand, by incandescence, lights of moderate power, equal for example to one or two gas-burners, can be produced, and this would be of course a property of essential importance in any general use of electricity for domestic lighting.

It is on these subjects that several of the most ingenious minds of the day are now working, and what we have above stated not only gives the present state of the problem, but will prepare the reader to comprehend the new developments as they appear.

The next application of Faraday's discovery of magneto-induction is found in the Bell telephone. In this instrument a series of electric currents is developed by the movements of a thin plate of iron in front of a steel magnet, around whose end a wire is coiled. As the thin iron plate vibrates to the impulse received from the voice of one speaking near it, the lines of force about the magnet are caused to move, and so cut across the coils of wire, and conse-

quently develop in them electric currents. These fluctuating electric currents, carried by a telegraph wire to a distant place, modify as they vary, the attraction of a similar magnet for a like thin iron plate, and thus this plate repeats the motions of the first one, and gives to the ear of the listener the motions which constituted the sounds in the spoken words uttered against the first iron plate.

Modifications in form or arrangement of parts have been made by various experimenters and inventors, but the same principle pervades all the telephones of this class.

Two other fundamentally different principles, however, have been and are now used in other classes of telephone :

First, the fluctuation of a current by the change in perfection of contacts by variations of pressure. This is found in Edison's carbon telephone, and in the microphone.

It was long ago shown, by Dr. Robison,* that what we commonly regard as contact between different bodies is very far from being absolute ; that, for example, one plate of smooth glass resting on another did not touch the first by about one five-thousandth of an inch, and that, to bring two pieces of glass an inch square into even approximate contact, a pressure of one thousand pounds must be exerted. Thus, if two conductors rest on each other, and a current passes between them, it must leap over this space and experience resistance to its passage in so doing. Any increase of pressure between the two surfaces will diminish this distance and increase the flow of the current by rendering its passage easier. This principle is applied in Mr. Edison's carbon telephone by using a little button of lampblack and a plate of platinum as the surfaces of contact between which an electric current is made to flow. If we speak against an elastic plate which presses these surfaces together, the vibrations communicated by the voice will vary this pressure, and correspondingly vary the current flowing. This varying current carried to a distant place will modify the action of a magnet on a thin iron disk, and so repeat the motions, sounds, or words which were the original cause of the fluctuations in the electric current. In place of this carbon button and platinum plate as a variable contact, we may have one piece of metal loosely resting on another, as, for example, one iron nail laid across another, and thus produce one of the most surprising forms of the microphone ; for, with such a rough combination as this, what we say to the loose nail will be heard by our friend miles away.

* "System of Mechanical Philosophy," Edinburgh, 1822, vol. i., p. 247.

The other principle applicable to telephonic communication was no doubt involved in some of the early experiments of Mr. Elisha Gray, although first distinctly announced by Mr. Edison. It is this:

When an electric current passes between certain substances, it greatly modifies their friction. Thus, if we pass a current from a piece of platinum into a strip of paper moistened with potash solution, and try to draw the platinum along the surface of the paper while the current is being varied, we can not move it steadily, but it will go by jerks, because the friction will so vary that the platinum now drags and now slides. It is easy to see how this can be applied to the transmission of sound. Let the current be fluctuated by the voice, by the use of the carbon and platinum contact, for example, and then, at the other end of the line, make the same current pass from a platinum brake, connected with a sounding-board, into a roller covered with prepared paper, and kept constantly turning so as to draw the brake forward by friction. As the current varies, the friction varies; and thus the sounding-board is variously pulled and made to vibrate, or, in other words, to sing.

It is just now announced that Mr. Edison has, by the use of this principle, produced a talking telephone which speaks louder than any other heretofore made, and can, in fact, be heard all over a large room.

Progress in Molecular Physics, or the Mechanics of the Atoms.

Among the most interesting developments in recent scientific research are those which seem almost to give us a view of the ultimate constitution of matter, and to be on the point of introducing us face to face with the original atoms or molecules out of which material substances are built.

The remarkable researches of Professor William Crookes, of London, which we may best indicate in a word as those grouping themselves about the "radiometer," are already old, but they have been followed up by the same investigator on a new line, with the most admirable results. Here, however, as elsewhere, we must go back to the older foundation in order truly to appreciate and comprehend the later superstructure.

Crookes's radiometer and related experiments showed essentially the following facts about the behavior of the atoms or molecules of gases and solid substances:

When a heated solid is surrounded by a gas, like air at its usual density, the rapid molecular vibrations of the hot solid, which con-

stitute its heat, cause it to dash off or strike off those atoms or molecules of the air which run against it. For it must be remembered that the whole mass of air is believed to be made up of minute particles or molecules, perfectly elastic, and vibrating with great velocities, but so crowded together that no particle can travel far before it strikes against another, and so reverses and exchanges its motion. Indeed, if we could see the molecules or particles in a mass of air, the whole would shimmer, as it were, with the eternal, restless, back-and-forth motion of the innumerable flying particles.

Now, suppose that we have a body hot on one side and cold on the other, surrounded by air at ordinary density, what will happen?

The vibrating air-particles which strike on the hot side will be driven off with a greater velocity than they had on arriving, and those striking the cold side will only rebound with the same velocity they had before, and the difference in reaction between these two sets we might perhaps suppose would make the hot body move backward away from the hot side where it was kicking off the air-particles so violently. But, on further reflection, we will see that such a result ought not to follow; for, though the hot surface of the body would drive itself back by its violent striking off of the air-particles, yet this action would be compensated by another, namely, the air-particles so driven off would, by reason of the greater motion they had received, fly farther, and carry off with them more of the surrounding air-particles than they would if they had only moved at the common rate. The result of this would be that they would be longer in coming back to strike again against the hot body, and would also have delayed the arrival of other particles which would otherwise have struck the hot body, and this action will exactly compensate and counteract the other so that the hot side of the body will have no tendency to cause motion in it. Now, however, let us suppose that we inclose this body hot on one side but cold on the other in a vessel and begin to pump out the air from around it.

As we exhaust the air the cloud of flying particles will get thinner and thinner, and each particle will move farther and farther before it reaches collision with one of its neighbors, and the particles dashed off by the hot side will keep back the general crowd of moving air-particles to a greater and greater distance. As long, however, as there *is* such an outlying and surrounding crowd of particles, in whose mass the heat-repelled molecules expend their force, the reaction produced in the hot side of the body, by driving

these last-named particles violently off, will be exactly compensated by the corresponding diminution in the blows it would receive from this crowd of normally moving particles which are thus held off by the others.

When, however, the exhaustion reaches such a point that there are no longer particles enough to form this outlying crowd, then the struck particles, which are violently repelled, will encounter no others, but will fly all the way in a free path to the surface of the inclosing vessel.

Moreover, it will also be true at the same time that the air-particles which strike on the cold side of the body will likewise move in free paths, without other than occasional collision, until they strike on the surface of the containing vessel—for of course the whole interior of the exhausted vessel must be equally rarefied, and the particles equally scattered in all parts.

Now, then, it is evident that under these conditions a new set of results will follow. The hot side of the body, repelling or striking off the air-particles violently, will thereby drive itself back as a rower drives his boat forward by pushing the water back; while, on the other hand, the cold side of the body would not repel or drive off the air-particles striking it with any such energy, and would not therefore cause in itself any such reactionary motion as would balance that developed by the hot side. The unequally heated body would therefore move, its hot surface retreating and its cold side advancing, as we might say.

Yet further: The particles violently thrown off from the hot side would strike the opposite side of the containing vessel more powerfully than would those more gently thrown back by the cold side; and consequently, if the unequally heated body were fixed, and the containing vessel were free to move, it would move away from the hot side and toward the cold side of the interior body.

To prepare a body hot on one side and cold on the other is not difficult. Dr. Crookes first did this by taking a little package of sheets of mica, and coating this package on one side with lamp-black. When this was exposed to sunlight, the black side grew hotter than the other. Such little packages of mica, mounted like the paddles of a wheel, made the motive power of his radiometers, and moved round as though the black or hot side was backing away from the air in front of it.

By floating the glass vessel which contained the little wheel on water, and then preventing the wheel from moving by an appro-

priate use of magnets, he showed that the glass vessel would then turn round, as if driven away from the black or hot sides of the paddles.

By another arrangement, he also caused the current of repelled air-particles to turn round a sort of propeller-wheel.

By these and countless like experiments, we were for the first time introduced to air under such conditions that we could observe the behavior of its individual particles or molecules when they were acting not in mass, but each on its own account like elastic balls flying about between the cushions of a billiard-table, only without loss of motion and without rest.

Now, using the same highly rarefied air or other like gas as the material for his experiment, Dr. Crookes has shown what is its behavior when electricity, in place of heat, is the exciting cause of the motions studied.

He finds that just as a hot body caused violent motion in the air-particles which came in contact with it, so one electrically excited produces similar motions in the adjacent air-particles. As a result of these motions, the air-particles immediately around the excited body seem to drive away the mass of the air, and, by their continual bombarding or pommeling of the rest, keep them at a distance, which varies with the degree of electrical excitement, the rarefaction of the gas, and other conditions.

The limit of this "clearing," kept open in this way, is marked by a luminous area, whose light is supposed to be produced by the blows of the flying molecules upon the relatively stationary outlying crowd.

A house on fire, surrounded by a disorderly crowd, kept off to a certain distance by the clubs of an active police force, is an imaginary picture which might be, perhaps, in some sort suggestive of the state of affairs here supposed, only among the air-molecules the police keep off the crowd by "butting" at them.

When the exhaustion is carried to such an extent that the outlying particles, which constituted the crowd, are all removed, the excited ones run all the way to the walls of the vessel before they encounter anything to restrain their motion, and then, running their heads against this solid wall, they develop by the blow a very beautiful and peculiar phosphorescent light.

The motions of these particles are very accurately directed in straight lines at right angles to the excited surface, and thus they can be cut off from any part of the interior of the vessel by a screen

of glass, mica, or other body, transparent or opaque. Moreover, they are capable of producing mechanical motion.

Thus, if a little paddle-wheel is hung in the interior of one of these vessels, in such a position that the storm of flying molecules is shaded off from half of its paddles, it will be driven round just as is an undershot water-wheel in a mill-race.

To describe all the remarkable experiments which have been made in this connection would fill this entire Journal, and we must, therefore, here leave this remarkable investigation, which seems to introduce us, like the microscope, to a new and wonderful world of the indefinitely minute.

HENRY MORTON.

VII.

LAW AND DESIGN IN NATURE.

Prof. Simon Newcomb. Rev. Noah Porter, D. D., LL. D.
Rev. Joseph Cook. Rev. James Freeman Clarke, D. D.
Rev. James McCosh, D.D., LL. D.

Professor NEWCOMB.

The object aimed at in the present discussion is to take a first step toward securing a better understanding of each other's position between two conflicting schools of thought respecting the course of Nature. One of these schools we may call that of the scientific philosophy, because it is for the most part represented by investigators or students of science. The other is that of the religious philosophy, but in designating it thus we do not mean to imply that it is necessarily unscientific, any more than that the scientific school is necessarily irreligious. Perhaps it would be better to call it the theological school of thought, because it seeks in Nature to find proof of a directing Mind, while the other school studies Nature solely to learn her phenomena, and to draw such philosophic conclusions as may be founded on their study.

Whether there is a necessary conflict between the views of the two schools, we shall not pretend to say; we are concerned only with the fact that a conflict does exist, and that it turns on certain questions respecting what we may call the fundamental methods of Nature. It is assumed on both sides that there is some sort of uniform plan and method in the course of Nature, but there is not only no agreement, but no mutual understanding as to what that plan and method are. To the scientific school the other presents itself as criticising its fundamental position, and yet in no case directly denying it. So far as can be understood, the theological school refuses to express any opinion on the fundamental proposition on which the whole discussion turns, but appears equally ready to admit or deny it according to the bearing of the argument to be founded on such admission or denial. It is not pretended that this is a fair statement of the position they mean to occupy, but only that it is the manner in which their position presents itself to the other school. We need not discuss the question which side the fault is on, since

any party which does not understand the other has a right to state his difficulties, and to ask the other for explanation. The first step toward clearing the ground for a mutual understanding is, to state and explain the position taken by the scientific school, and to inquire of the other whether this position is entirely untenable. The fundamental postulate of the scientific philosophy is a principle founded on a limited series of observations, and extended by induction to the whole course of Nature. It may be expressed in the following words:

The whole course of Nature, considered as a succession of phenomena, is conditioned solely by antecedent causes, in the action of which no regard to consequences is either traceable by human investigation, or necessary to foresee the phenomena.

The sole question presented for discussion in the present series of papers is the following: To what extent is the above postulate consistent with sound doctrine?

The somewhat vague term "sound doctrine" is used purposely in place of a more specific one, in order to give the representatives of the opposing school the widest range of position from which to express acquiescence or dissent. We might have inquired whether the doctrine is consistent with the action of a Supreme Will in the processes of Nature; whether it can be reconciled with the doctrine of final causes, or with any other doctrine respecting the relation of the Creator to his works which one might think proper to propound. But, by doing so, we should narrow the field of inquiry in such a way as to make the result indecisive, and therefore unsatisfactory.

It must also be noted that we do not inquire whether the hypothesis is itself sound in doctrine, but only whether it is consistent with soundness. It would be vain to expect in a single discussion to reach any result respecting its absolute truth or falsity, or even to argue its truth in its widest extent. The question of its truth enters in this indirect way: that, if it is inconsistent with any admitted or observed fact, it will be allowable to demonstrate the inconsistency. So also if it may be accepted within certain definable limits, but is not admissible beyond those limits, that fact ought to be clearly understood. And we may remark, at the outset, that if one admits that the postulate may, for aught we know, be true for the whole field of phenomena, he admits all that the scientific school claims in this connection. The postulate is, in fact, presented as a scientific and not as a theological principle, and the question whether it is valid as such must be settled before any conclusion in a field higher than that of phenomena can be founded upon it.

In order to confine the discussion as closely as possible to the exact points of real or possible differences, we shall briefly explain the postulate in such a manner that there shall be as little room as possible for misunderstanding it. In doing so we shall make no attempt to argue its truth or falsity, but only seek to make known its meaning and scope. The difficulties which have heretofore arisen have their origin partly in a misconception as to what the scientific philosopher means when he speaks of reducing phenomena to general laws, or explaining them by the operation of natural causes, and partly from a failure to distinguish clearly between phenomena as such and the abstract ideas with which they may be associated. It is worthy of remark that the difficulty of understanding the postulate arises not from its complexity or the abstract character of the ideas involved in it, but from its extremely simple and concrete character. It involves no ideas but such as are familiar from childhood and really understood by children, though they may not be able to express them in language. We are indeed in a difficulty similar to that which might be encountered by a rustic when called upon to define what he meant by a loaf of bread before a Professor of Logic, and to word his definition in such a way as to stand good against all the Professor's analysis. If our own attempt fails to stand analysis, we shall repose on the same hope that would sustain the rustic—namely, that, after all, his interlocutor understood what a loaf of bread was just as well as as he did himself.

The first point to be explained is, what is meant by considering the course of Nature simply as a succession of phenomena. The reason for this restriction is, that we must agree about phenomena before we can have any intelligent discussion respecting what lies behind or above them. The meaning of the restriction is, that we eliminate from our discussion all those abstract conceptions which are frequently associated with phenomena, but which do not serve to assist in defining phenomena. Among these conceptions are the opposing ones of potentiality and necessity, which several schools of philosophers persist in trying to impose on phenomena. These conceptions have no place whatever in scientific investigation, and are therefore not to be in any way brought into the present discussion. For instance, the scientific philosophy does not assert that gravitation "must" act, that a stone "necessarily" falls, or that the course of Nature "can not" do otherwise than conform to mathematical laws; it only asserts that as a simple matter of fact gravitation does act, and events in Nature do occur in conformity with defina-

ble laws. If we admit this, the question is settled without discussing the question of necessity. Nor is it any argument against the postulate to maintain or show that things may, might, could, or would be, different from what they are, because the postulate considers things only as they are and not as they may be. The only modifications of a proposition which it admits are: The fact is so; the fact is not so; I do not know whether the fact is or is not so. The latter, it will be remarked, does not express anything respecting the fact, but only a state of ignorance confined to our own minds.

Another class of conceptions associated with phenomena, but entirely excluded in the present discussion, are those of the invisible forces or causes which may lie behind the visible course of Nature. Respecting this every one is at liberty to hold any opinions without coming into conflict with the scientific philosophy, provided only that he draws no conclusion inconsistent with what the other believes to be a legitimate induction from observation. For instance, it is not objectionable to the postulate to say that all things are determined by a Divine Will, because the postulate assumes nothing respecting such will, and has nothing whatever to do with its supposed immanence in the whole course of Nature, unless conclusions inconsistent with observed facts are founded upon it. So long as the religious school admits that stones fall, water runs, and storms move, according to the scientific postulate, they may place any occult causes behind those phenomena which do not lead to results incompatible with it. For the same reason there is no objection to maintaining that things were designed to be as they are, unless such design is considered to be a physical cause which can be traced by studying such things.

We now reach the main proposition, that the course of Nature is conditioned solely by antecedent causes, in the action of which no regard to consequences can be traced. We use the word "conditioned" instead of "determined," to do away with all conception of necessity, and to avoid being understood as saying that things must be instead of simply saying that things are. We also use the very ambiguous word "cause," susceptible of being pulled to pieces, and shown to mean everything, anything, or nothing, at pleasure, in its ordinary every-day sense, which everybody understands, and which therefore need not be further defined. If it be replied that this every-day sense is vague, and susceptible of minute subdivisions into different meanings, we reply that any meaning consistent with ordinary ideas may be assigned to it.

The further distinction of what is meant can be better understood by example than in any other way. Let us take the case of the destruction of a theatre by fire, and inquire why it occurred. We can give three answers:

1. That the fire was the work of a Higher Being, who desired to attain some end. Perhaps there were bad people in the theatre, who were to be punished or prevented from further crime; or perhaps the theatre was injuring the morals of the community, and was therefore burned for the public good.

2. That the cause was entirely inscrutable, and therefore such as to elude all human investigation.

3. That it occurred in one of the many ways by which every one knows that fires may occur, and that the character of the theatre or the intentions of the wicked people had nothing at all to do with the matter.

Of these three possible modes of occurrence of the fire, only the third is admitted by the postulate of the scientific school as affording an explanation. By an explanation we mean the statement of a general principle covering all cases of the origin of fires, and of some special facts showing the fire to be the combined result of the fact and the principle. For instance, whenever a match is rubbed in a certain way and in a certain position relative to a piece of drapery, a fire will be the result. In this case the required conditions were fulfilled by an actress treading upon a match. The fire will always result when these same conditions are fulfilled, no matter what the character of the play or of the audience. But, according to the scientific postulate, we could make no such general assertion respecting the first explanation, which is therefore inadmissible as an explanation.

As another example we may take the motions of the planets. By assuming that these motions take place in accordance with the law of universal gravitation, the astronomer is enabled to predict, years or centuries in advance, that the moon's shadow will pass over certain regions of the earth at certain stated times. Why can he not predict every natural occurrence—the earthquakes, the storms, the floods, the plagues of the future—with equal certainty? The answer of the postulate is, that it is only on account of his want of knowledge and want of reasoning power. A mind capable of expressing in language the necessary data, fully acquainted with certain laws, and possessed of a calculus of sufficient power, could foresee the end of all things from the beginning by a process the same

in kind as that by which the mathematician foresees the celestial motions. The celestial motions, phenomenally conditioned by the law of gravitation and by the initial circumstances of the motions, are supposed to symbolize the whole course of inanimate Nature, so far at least as the phenomena are concerned.

We have presented an antithesis between the theory presented for discussion and the theory of final causes which assumes that things have been arranged with a visible purpose. But the ground is frequently taken that there is really no antagonism between these two theories, and that the doctrine of a course of Nature proceeding in accordance with invariable laws is entirely consistent with the doctrine of final causes. But, notwithstanding this occasional assertion of consistency, every advance of the scientific philosophy toward presenting a complete theory of the course of Nature in accordance with their doctrine is vigorously contested. Now, if theologians find the doctrine alluded to not inconsistent with their views, they have no right to contest it in the manner that they do; and the scientific philosopher has a right to presume that their seeming inconsistency is founded on some failure between the two schools to give the same meaning to the term, laws of Nature. An understanding on this point can be best reached, not by an abstract definition, but by concrete examples of the meaning of the scientific postulate, like those just given. Just so far as the theologian can reconcile the motions of the planets or the burning of the theatre with final causes or with a directing hand, so far is he at liberty to reconcile the whole course of Nature in the same way.

We have stated the scientific postulate in the widest and most general terms. Had we been disposed to narrow the inquiry, we might have substituted for it a statement of the doctrine of evolution, because it is here that the dispute is at present raging with most bitterness. But, since the doctrine of evolution is itself founded on the postulate, our discussion is more complete if we include the more general proposition. The theory of evolution maintains that certain forms formerly supposed to be the result of special creation are really the product of natural causes of precisely the same character with those which cause the movement of storms and the chemical changes going on in the world around us. Hence a consideration of the theological tendencies of the one will include the same thing for the other.

SIMON NEWCOMB.

DR. PORTER.

PROFESSOR NEWCOMB, it will be observed, opens the discussion by giving his views of the antagonistic positions taken by the scientific and theological schools respectively in regard to the course of Nature. So far as the last school is concerned, I am compelled to say that he evinces more candor and desire to be just than success in stating what he conceives this school to hold. What he criticises it for holding, and implies that it does hold, is something like this: The theological school conceives final causes to be coördinate with efficient or physical causes, holding that they are manifested by similar indications and are tested by similar experiments. In the example cited of the burning of a theatre, the scientific school recognizes only physical agencies or causes; the theological discerns a final cause, or the purpose of "a Higher Being who desired to attain some end," i. e., a moral effect, and directly produces it, as the torch causes the physical conflagration.

I can not accept this as a correct statement of what is taught or implied by any school of thinkers which holds that design or final cause is manifest in the course of Nature, or must be assumed to explain it. The arguments which Professor Newcomb arrays against this view seem to me as uncalled for as the fiction toward which he directs them is imaginary.

Leaving this point to return to it again, I pass to his view of "the fundamental postulate of the scientific philosophy," as it is stated by himself. "The whole course of Nature, considered as a succession of phenomena, is conditioned solely by antecedent causes, in the action of which no regard to consequences is either traceable by human investigation or necessary to foresee the phenomena." This statement, it will be seen, is divided into two portions, an affirmation and a denial. The affirmation seems to me defective for its omissions, the denial to be false, and the postulate itself to be therefore inconsistent with sound doctrine. By sound doctrine I mean truth of any kind, whether it pertains to the science of Nature, the science of man, or the science of God. I do not argue from the inferences or consequences to theology that might follow from the postulate that it is therefore untrue, but that it is unsound in what it omits and denies, and for this reason is inconsistent with "sound doctrine." I have no favors to ask and no appeals to make as a theologian, but write only in the interests of science and the truth.

The defects of the affirmative part of the postulate are made more obvious by the author's subsequent explanations of his mean-

ing. He tells us that, in asserting that science concerns itself with the succession of phenomena, he desires to get rid of those abstract conceptions which are often associated with phenomena—particularly "potentiality and necessity." We are tempted to inquire whether these conceptions are any more abstract than the conception of "succession"? We also inquire whether the assertion in the postulate, that this succession of phenomena is "*conditioned* solely by *antecedent causes*," does not imply the presence and validity of these very conceptions of potentiality and necessity? If the author denies causation with potentiality and necessity, he must limit science to inquiries respecting "succession," and assign to it a narrower sphere than the positivists who recognize the relation of similarity and succession.

He proceeds to assert that the only question with which science concerns itself is what can be established as *a fact*. We wait to be informed what he means by a fact or phenomenon. Does he mean that science concerns itself with facts or phenomena as such, or with facts and phenomena as *related?* If the latter, is not the question open whether the relations of *design* may not as properly be called facts as the relations of *time* or *causation?*

He adds, all "invisible forces or causes" which "lie behind the visible course of Nature" must be excluded, and again, all "occult causes." But why are relations of design, or the facts or phenomena which they explain, any more invisible or occult than the relations of succession or causation? Perhaps by "invisible" and "occult" he means spiritual as contrasted with physical, and thus would limit Nature to material forces and phenomena, excluding spirit from holding any place in Nature or any relations to Nature, or any agency in its phenomena, which science is bound to recognize.

Whatever view we take of the affirmation of this postulate, it unwarrantably narrows the conception of the course of Nature as the subject-matter of science. We would widen that conception as follows:

1. The course of Nature includes the phenomena and facts of spirit as truly as those of matter. Scientifically considered, the one are no more "invisible," "occult," or "abstract" than the other. Of the two, the agency of spirit is more visible, manifest, and concrete than any agency of matter in the production of that effect which we call science.

2. These facts or phenomena, these forces or agents, are connected by various relations, as of time and space, involving number and geometry; also of likeness or analogy, cause and effect, and per-

haps others. These are the materials from and by which science is constructed by the rational spirit, as it determines the properties, forces, and preëminently *the laws* of both matter and spirit. That Professor Newcomb should fail to emphasize the preëminence of laws as the subject-matter of science may well occasion surprise.

3. Laws are affirmed of the action of forces as "conditioned" or modified mathematically in the production of effects by relations of time or space; also as conditioned by one another when two or more forces act together in the production of any constant or regular effect. In the discovery of forces, properties, or laws, science is not, however, shut up to the use of mathematical tests or verifying experiments. Some sciences of matter, even, e. g., physiology, do not admit these criteria. Even those which do, recognize very largely the facts and analogies, the interpretations and probabilities, which precede and follow such tests. Every one of them makes the most liberal use of facts and relations, which must be assumed as the preconditions of the experimental element in induction.

4. A universe of law is, *ipso facto*, a universe of design. A "course of Nature" the phenomena of which occur in regular succession, much more a course of Nature conditioned by causes, is neither thinkable nor explicable except by antecedent and controlling purpose. Professor Newcomb says it is assumed that there "is some sort of *uniform plan and method* in the course of Nature." But plan and method imply design, or at the least are best explained by design. Design is objective thought—"a plan or method," "the *fundamental* method of Nature," as Professor Newcomb elsewhere says. Objective thought is completed and explained by a subjective thinker whose plans and methods science interprets.

5. Induction itself requires design, or "a plan or method in the course of Nature" as its postulate. Professor Newcomb says that the fundamental postulate of the scientific philosophy is "founded on a limited series of observations, and extending by induction to the whole course of Nature." But he forgets that he has already provided a postulate still more *fundamental*—if this is not an Hibernicism—in asserting "a plan and method" in Nature. Moreover, what he calls "extending by induction" can be explained and justified only by a belief in interpretable analogies, which are explicable only by design, or "fundamental methods of Nature."

6. The course of Nature furnishes constant examples of the interaction of matter and spirit. Subjective thought makes itself manifest as objective thought through material phenomena. Though

the same media, objective thought and subjective thought are interpreted by the rapid processes of natural induction. Moreover, thought or spirit controls matter and produces and prevents, modifies and arrests, the operation of physical agencies without hindering their activity or interfering with their laws. It is true the mutual relations of spiritual and material force are very imperfectly understood, and the laws of their coaction are inexactly determined, but the fact that they act in harmony with one another—while both are potent factors to varying effects—can not be questioned. All this is affirmed in the postulate of *a plan or method* in Nature, and confirmed by our experiments and observations.

7. In the economy of Nature, spirit is of greater significance than matter, and the phenomena and effects of the physical universe proceed in subservience to ends which concern rational and sentient beings. This is assumed by Science itself, and by Art, the servitor of Science. What were the unknown and the unused powers of Nature, were they reflected by no interpreting mind and transfigured by no imitative or constructive skill? What were these intellectual achievements of science and art, if they did not minister to the enjoyments of sentient souls? What were sentient enjoyment, were it not used as a motive for gratitude and love and worship in those who, in knowledge, enjoyment, and duty are like God, the Being who is the fundamental postulate of all science, and the moral Ruler of the spirits who interpret his thoughts, his feelings, and his will?

Thus far we have sought to supply what is omitted in what Professor Newcomb affirms of the course of Nature. Our enlarged definition will enable us briefly to dispose of *his denial*, viz., "in the action of which no regard to consequences is either traceable by human investigation or necessary to foresee the phenomena." By "a regard to consequences," he must mean consequences as designed, not merely physical sequences, but psychical or spiritual effects, more exactly sentient or moral good or evil. When he says that these "can not be traceable by human investigation," he may mean that they can not be tested by a certain class of scientific criteria or processes, i. e., by mathematical formulæ or physical experiments. Taken in this sense his words are true; but if he means that their presence and agency can not be discerned and proved by evidence as satisfactory as that which is technically called scientific, and indeed by evidence precisely similar to that which is accepted for many facts and truths in physical science, we dissent from him altogether. No man who rightly estimates the variety in the kinds of evidence

which enforces our belief in the various facts and truths of physical science would deny that design or purpose is as clearly traceable in many of the arrangements and phenomena of Nature as the causes or laws that are ascertained by experiment or induction.

In the example of the destruction of a theatre by fire, Professor Newcomb gives three possible answers to the question "why it occurred." Overlooking that "why" in such a connection may mean "whence," "how," or "for what," as it asks for answers in the terms of *a cause*, *a law*, or *an end*, he insists that only one of two answers can be given, viz., either "the fire was the work of an action of a Higher Being," or was the effect of any of the ordinary physical agencies, and reasons as though the one necessarily excluded the other. In other words, he overlooks the solution that the effect might be caused by physical agencies, and still be designed by God.

He subsequently refers to this last position as possible, but he obviously regards it as a theory for which theologians are responsible and are bound to look after, but which has no scientific value. Had he but reflected that *events* in Nature and spirit, whether designed or undesigned, are to be distinguished from the *forces* and even from the *laws of Nature*, and that similar forces, acting under fixed laws, are capable of an indefinite variety of effects, and that an indefinite variety of physical effects may be adjusted to an equally indefinite variety of psychical needs by a designing mind, he would have seen that science provides the amplest room for the accomplishment of the utmost conceivable variety of the designs of a Higher Being, and all by means of the forces and laws of Nature.

The example from the motions of the planets he presses to another application. In astronomy, he says, we not only can explain the present but can predict the future, and, had we the same insight into the agents and laws of other phenomena, we could in like manner predict the minutest event in any department of the physical universe. From this he would have us conclude that the possibility of inferring "a visible purpose" is excluded if design is admitted. To this we reply that the constancy of the operations of Nature and the consequent possibility of foreseeing the minutest consequences are no more inconsistent with the belief in design in the future than an insight into these forces and operations of Nature is inconsistent with such belief at any present moment. But why, then, do theologians so vigorously contest "every advance of the scientific philosophy toward a complete theory of the course of Nature in accord-

ance with their doctrines?" We reply that, had Professor Newcomb, in this and other discussions of this topic, insisted that the course of Nature as truly manifests design as it does the causes or the successions of phenomena, one theologian at least would not have vigorously contested his opinions of design, however unsatisfactory he might have found some of his conceptions of the sphere and postulates of science.

We ought not to be surprised that Professor Newcomb, being an astronomer, should so confidently assert that the celestial motions are supposed "to symbolize the whole course of inanimate Nature." But Nature is also animate and ensouled, and the forces and laws which control the activities of life and spirit may not be symbolized by the celestial motions. The eminent Du Bois-Reymond, in his well-known address on the limits of our knowledge of Nature, after discoursing of what he calls the astronomical knowledge and foreknowledge of Nature's forces and laws and events, draws a sharp line between the field of this *astronomical knowledge* and the agencies and relations in the course of Nature which can never be thus mastered. In respect to some of these questions he is content to say, *ignoramus*—in respect to others, *ignorabimus*. If this is true of the forces and relations of Nature, how much more must it be true of the relations which the self-existent Creator holds to the phenomena and laws of both matter and spirit as they manifest his thoughts and accomplish his designs!

NOAH PORTER.

MR. COOK.

KEPLER relates that one day, when he had long meditated on atoms and their combinations, he was called to dinner by his wife, who laid a salad on the table. "Dost thou think," said he to her, "that if from the creation plates of tin, leaves of lettuce, grains of salt, drops of oil and vinegar, and fragments of hard-boiled eggs were floating in space in all directions and without order, chance could assemble them to-day to form a salad?" "Certainly not so good a one," replied his fair spouse, "nor so well seasoned as this." (Claude Bertrand, "Les Fondateurs de l'Astronomie moderne," p. 154.)

In Baron d'Holbach's parlor, in a company of atheists, the witty Abbé Galiani said: "I will suppose, gentlemen, that he among you who is the most fully convinced that the world is the effect of chance is playing with three dice—I do not say in a gambling-house, but in

the best house in Paris. His antagonist throws sixes once, twice, thrice, four times—in a word, constantly. However short the duration of the game, my friend Diderot, thus losing his money, will unhesitatingly say, without a moment's doubt: 'The dice are loaded; I am in a bad house.' What, then, philosopher? Because ten or a dozen throws of the dice have emerged from the box so as to make you lose six francs, you believe firmly that this is in consequence of an adroit manœuvre, an artful combination, a well-planned roguery; but, seeing in this universe so prodigious a number of combinations, thousands of times more difficult and complicated, more sustained and useful, you do not suspect that the dice of Nature are also loaded, and that there is above them a great rogue who takes pleasure in catching you."

In a corner of his garden, a Scotch philosopher, the wise Beattie, drew with his finger the three initial letters of his child's name, sowed the furrows with cresses, and smoothed the earth. The child was only six or seven years of age, and was learning to read, but had been taught nothing concerning God. "Ten days after," says Beattie, "the child came running to me all amazed, and told me his name had grown in the garden. I smiled at these words, and appeared not to attach much importance to what he had said. But he insisted on taking me to see what had happened. 'Yes,' said I, on coming to the place, 'I see well enough that it is so, but there is nothing wonderful in this—it is a mere accident,' and went away. But he followed me, and, walking at my side, said very seriously: 'That can not be. Some one must have planted the seeds to make the letters.' 'You think, then, this is not the result of chance?' 'Yes,' said the boy firmly, 'I think so.' 'Well, then, look at yourself; consider your hands and fingers, your legs and feet, and all your members. Do they not seem to you regular in their appearance and useful in their service? Can they be the result of chance?' 'No,' was the answer, 'some one must have made them.' 'Who is that some one?' I asked him, and he replied that he did not know. I then made known to him the name of the great Being who made all the world; and the lesson was never forgotten, nor the circumstance which led to it."

These familiar concrete examples emphasize the distinction made prominent by Chalmers, and after him by Mill, between the laws of matter and the collocations of matter. "We can imagine all the present and existing laws of matter to be in full operation," said Chalmers ("Natural Theology," ii., 11), "and yet, just for want of a

right local disposition of parts, the universe might be that wild, undigested medley of things in which no one trace or character of a designing architect was at all discernible." Mr. Mill says ("Logic," iii., 12, 16) that "collocations as well as laws are necessary to the operation of Nature," and he does not overlook the profound truth that "the laws of Nature do not account for their own origin." Professor Newcomb glances at this distinction, but apparently does not see that in doing so he makes a concession which flatly contradicts his theory. "The celestial motions," he tells us, are "phenomenally conditioned by the law of gravitation *and* by the initial circumstances of the motions." The question is, What accounts for those "initial circumstances"? Is any "regard for consequences" traceable in them? The word "and" in the above sentence of Professor Newcomb's is in fatal conflict with the word "solely" in his postulate.

A slovenly observation of facts and a lack of rigor in applying to the explanation of facts the principle that every change must have an adequate cause are the most ordinary sources of skepticism as to the existence of design in Nature. A specialist may be lynx-eyed and yet wall-eyed.

Is there in the universe intention not my own? Every one answers, "Yes—in other human beings." But, precisely the same argument which proves to me that a human being other than myself has had an intention in any given work proves that a Supreme Intelligence has had an intention in what is called Nature. It is inconsistent with sound doctrine for me to deny that other human beings have intentions. It is for the same reason inconsistent with sound doctrine for me to deny that the Supreme Intelligence has intentions, or that Nature has final as well as efficient causes?

1. Let cause mean all that is necessary to explain an effect.

2. In a statue of Hercules we shall have, therefore, according to Aristotle's distinctions between causes, first, a material cause in the marble; an efficient cause in the chisel of the sculptor; a formal cause in the shape of the statue; and a final cause in its destination to be set up to adorn a temple.

3. All these causes may coexist. Neither in man's work nor in Nature does the operation of efficient causes shut out that of final causes.

4. The fullest proof that the course of Nature is governed by efficient causes would be no disproof that it is also governed by final causes. To prove that a statue is made by a chisel is no disproof that it was made in order to represent Hercules, and to be set up in a temple.

5. It is the absurd claim of many physicists, who have not

studied philosophy, that efficient and final causes exclude each other, but the better educated of physicists make no such claim.

Huxley says : "The teleological and mechanical views of Nature are not necessarily mutually exclusive. The teleologist can always defy the evolutionist to disprove that the primordial molecular arrangement was not *intended* to evolve the phenomena of the universe."

6. Without here raising the question whether the theory of evolution is true or false, it is evident that it concerns only a question of process, or answers the question *How?* and not the question *Why?*

7. But the question *How?* does not exclude the question *Why?* and so the theory of evolution does not render final causes either impossible or useless.

8. Combinations of repeated and multiplex phenomena, such that they converge to one effect, exist in countless numbers in Nature.

9. Convergence of phenomena in repeated and multiplex cases is itself a phenomenon, and requires a cause.

10. When a certain coincidence of phenomena is remarked constantly, it is not enough to explain each phenomenon by referring it to its antecedent ; it is necessary to give a precise reason for the coincidence itself. (See Janet, "Final Causes," book i., chapter i., and book ii., chapter i.)

11. Certain combinations, as for example of the parts of the eye, are intelligible only on the supposition that millions of forces have combined so as to produce sight.

12. There is here a strange accord of the past with the future.

13. It is a fact of observation that this accord of the past with the future exists in Nature in cases innumerable.

14. It is to be false to the principle of causality to leave unexplained this accord of the past with the future.

15. As a cause must include all that is necessary to explain an effect, the plurality of causes is itself a proof that involution and evolution under natural law are an eternal equation.

16. But the strange accord of the past with the future in the growth of the eye will be fortuitous, or without adequate cause, if it is not granted that the combination of parts has taken place under control of a tendency that from the first has in view the sight, which springs up only at the last. The combination of millions of forces *so as* to produce sight is intelligible only on the principle that they have been combined *in order* to produce sight. "When the question is about an organic evolution which is in the future," says Claude Bernard, "we no longer comprehend the property of matter

at long range. The egg is to become something; but how conceive that matter should have as a property to include operations of mechanism which do not yet exist?" John Stuart Mill, in a well-known passage of his essay on "Theism," admits that the argument just stated concerning the eye is in strict accordance with the principles of inductive logic.

17. This reasoning does not start from the hypothesis that sight is an end, nor that the eye is an adaptation of means to an end, for either of these presuppositions would involve a vicious circle.

18. The reasoning starts from effects merely as effects, and from the observation that they are possible only because a certain strange accord exists between the past and the future, and this in the action of millions of forces.

19. The observation of facts, therefore, gives us as a criterion of final cause the agreement of the present and past with the future, and the determination of the former by foresight of the latter.

20. The demonstrated accord of the past and the future in the growth of the eye and the innumerable similar examples transforms the effects into ends, the causes into means, and the combination of the two into an adjustment of means to ends or *design*.

Professor Bain, the most self-consistent of the British materialistic school, admits that inertia is as clearly a property of matter as extension ("Mind and Body," last chapter). By inertia is meant the incapacity to originate force or motion. Nevertheless, this philosopher would give to matter a spiritual as well as a physical side, and yet he admits that the only possible union of spiritual and physical qualities in "one substance" is that of "close succession" in time. This latest and subtilest attempt to avoid the self-contradictions of materialism is equivalent to the assertion that, although a door can not be open and shut at one and the same time, yet, if you will open and shut it fast enough, it may be! The attempt has of course failed, and so the usual argument from the inertia of matter retains all its force:

1. If matter is essentially inert, that is, incapable of originating force or motion, all force and motion in matter originate in mind.

2. But matter is essentially inert.

3. Therefore, all force and motion in matter originate in mind.

The chasm between the primordial star-dust and the solar system, as well as that between the lifeless and the living forms of matter, can therefore be bridged only by the teleological as distinct from the mechanical theory of force.

JOSEPH COOK.

MR. CLARKE.

IN the paper which opens this discussion on "Law and Design in Nature," Professor Newcomb announces in a single sentence a proposition, the truth or falsehood of which, he tells us, is "the sole question presented for discussion in the present series of papers."

But, as soon as we examine this proposition, we find that it contains not one sole question, but three. The three are independent of each other, and do not necessarily stand or fall together. They are these:

1. "The whole course of Nature, considered as a succession of phenomena, is conditioned solely by antecedent causes."

2. In the action of these causes, "no regard to consequences is traceable."

3. And no regard to consequences is "necessary to foresee the phenomena."

Of these three propositions I admit the truth of the first; deny the truth of the second; and, for want of space, and because of its relative unimportance, leave the third unexamined.

The first proposition is so evidently true, and so universally admitted, that it was hardly worth positing for discussion. It is merely affirming that every natural phenomenon implies a cause. The word "antecedent" is ambiguous, but, if it intends logical and not chronological antecedence, it is unobjectionable. So understood, we are merely asked if we can accept the law of universal causation; which I suppose we shall all readily do, since this law is the basis of theology no less than of science. Without it, we could not prove the existence of the first cause. Professor Newcomb has divided us into two conflicting schools, one of theology and the other of science. Taking my place in the school of theology, I think I may safely assert for my brethren that on this point there is no conflict, but that we all admit the truth of the law of universal causation. It will be noticed that Professor Newcomb has carefully worded his statement, so as not to confine us to physical causes, nor even to exclude supernatural causes from without, working into the nexus of natural laws. He does not say "antecedent physical causes," nor does he say "causes which have existed from the beginning."

Admitting thus the truth of the first proposition, I must resolutely deny that of the second; since, by accepting it, I should surrender the very cause I wish to defend, namely, that we can

perceive design in Nature. Final causes are those which "regard consequences." The principle of finality is defined by M. Janet (in his recent exhaustive work, "Les Causes finales") as "the present determined by the future." One example of the way in which we can trace in Nature "a regard to consequences" is so excellently stated by this eminent philosopher that we will introduce it here: "Consider what is implied in the egg of a bird. In the mystery and night of incubation there comes, by the combination of an incredible number of causes, a living machine within the egg. It is absolutely separated from the external world, but every part is related to some future use. The outward physical world which the creature is to inhabit is wholly divided by impenetrable veils from this internal laboratory; but a preëstablished harmony exists between them. Without, there is light; within, an optical machine adapted to it. Without, there is sound; within, an acoustic apparatus. Without, are vegetables and animals; within, organs for their reception and assimilation. Without, is air; within, lungs with which to breathe it. Without, is oxygen; within, blood to be oxygenized. Without, is earth; within, feet are being made to walk on it. Without, is the atmosphere; within, are wings with which to fly through it. Now imagine a blind and idiotic workman, alone in a cellar, who simply by moving his limbs to and fro should be found to have forged a key capable of opening the most complex lock. If we exclude design, this is what Nature is supposed to be doing."

That design exists in Nature, and that earthly phenomena actually depend on final causes as well as on efficient causes, appears from the industry of man. Man is certainly a part of Nature, and those who accept evolution must regard him as the highest development resulting from natural processes. Now, all over the earth, from morning till evening, men are acting for ends. "Regard to consequences is traceable" in all their conduct. They are moved by hope and expectation. They devise plans, and act for a purpose. From the savage hammering his flint arrow-heads, up to a Shakespeare composing "Hamlet," a Columbus seeking a new way to Asia, or a Paul converting Europe to a Syrian religion, human industry is a constant proof that a large part of the course of Nature on this earth is the result of design. And, as man develops into higher stages, this principle of design rises also from the simple to the complex, taking ever larger forms. A ship, for instance, shows throughout the adaptation of means to ends, by which complex adaptations produce a unity of result.

And that there is no conflict between the action of physical causes and final causes is demonstrated by the works of man, since they all result from the harmonious action of both. In studying human works we ask two questions—"How?" and "Why?" We ask, "What is it for?" and "How is it done?" The two lines of inquiry run parallel, and without conflict. So, in studying the works of Nature, to seek for design does not obstruct the investigation of causes, and may often aid it. Thus Harvey is said to have been led to the discovery of the circulation of the blood by seeking for the use of the valves of the veins and heart.

The human mind is so constituted that, whenever it sees an event, it is obliged to infer a cause. So, whenever it sees adaptation, it infers design. It is not necessary to know the end proposed, or who were the agents. Adaptation itself, implying the use of means, leads us irresistibly to infer intention. We do not know who built Stonehenge, or some of the pyramids, or what they were built for; but no one doubts that they were the result of design. This inference is strengthened if we see combination toward an end, and preparation made beforehand for a result which comes afterward. From preparation, combination, and adaptation, we are led to believe in the presence of human design even where we did not before know of the presence of human beings. A few rudely shaped stones, found in a stratum belonging to the Quaternary period, in which man had before not been believed to exist, changed that opinion. Those chipped flints showed adaptation; from adaptation design was inferred; and design implied the presence of man.

Now, we find in Nature, especially in the organization and instincts of animals, myriads of similar instances of preparation, combination, and adaptation. Two explanations only of this occurred to antiquity—design and chance. Socrates, Plato, and others, were led by such facts to infer the creation of the world by an intelligent author—"ille opifex rerum." Democritus, Epicurus, and Lucretius, ascribed it to the fortuitous concourse of atoms. But modern science has expelled chance from the universe, and substituted law. Laplace, observing forty-three instances in the solar system of planets and their satellites revolving on their axes or moving in their orbits, from west to east, declared that this could not be a mere coincidence. Chance, therefore, being set aside, the question takes another form: "Did the cosmos that we see come by design or by law?"

But does this really change the question? Granting, for exam-

ple, the truth of the theory of the development of all forms of life, under the operation of law, from a primal cell, we must then ask, "Did these *laws* come by chance or by design?" It is not possible to evade that issue. If the universe resulted from non-intelligent forces, those forces themselves must have existed as the result of chance or of intelligence. If you put out the eyes, you leave blindness; if you strike intelligence out of the creative mystery, you leave blind forces, the result of accident. Whatever is not from intelligence is from accident. To substitute law for chance is merely removing the difficulty a little further back; it does not solve it.

To eliminate interventions from the universe is not to remove design. The most profound theists have denied such interruptions of the course of Nature. Leibnitz is an illustrious example of this. Janet declares him to have been the true author of the theory of evolution, by his "Law of Continuity," of "Insensible Perceptions," and of "Infinitely Small Increments." Yet he also fully believed in final causes. Descartes, who objected to some teleological statements, believed that the Creator imposed laws on chaos by which the world emerged into a cosmos. We know that existing animals are evolved by a continuous process from eggs, and existing vegetables by a like process from seeds. No one ever supposed that there was less of design on this account in their creation. So, if all existing things came at first by a like process from a single germ, it would not argue less, but far more of design, in the universe.

The theory of "natural selection" does not enable us to dispense with final causes. This theory requires the existence of forces working according to the law of heredity and the law of variation, together with a suitable environment. But whence came this arrangement, by which a law of heredity was combined with a law of variation, and both made to act in a suitable environment? Here we find again the three marks of a designing intelligence: preparation, combination, adaptation. That intelligence which combines and adapts means to ends is merely remanded to the initial step of the process, instead of being allowed to act continuously along the whole line of evolution. Even though you can explain by the action of mechanical forces the whole development of the solar system and its contents from a nebula, you have only accumulated all the action of a creative intelligence in the nebula itself. Because I can explain the mechanical process by which a watch keeps time, I have not excluded the necessity of a watchmaker. Because, walking through my neighbor's grounds, I come upon a water-ram pumping up water by a purely mechanical process, I do not argue

that this mechanism makes the assumption of an inventor superfluous. In human industry we perceive a power capable of using the blind forces of Nature for an intelligent end; which prepares beforehand for the intended result; which combines various conditions suited to produce it, and so creates order, system, use. But we observe in Nature exactly similar examples of order, method, and system, resulting from a vast number of combinations, correlations, and adaptations of natural forces. Man himself is such a result. He is an animal capable of activity, happiness, progress. But innumerable causes are combined and harmonized in his physical frame, each necessary to this end. As the human intelligence is the only power we know capable of accomplishing such results, analogy leads us to assume that a similar intelligence presides over the like combinations of means to ends in Nature. If any one questions the value of this argument from analogy, let him remember how entirely we rely upon it in all the business of life. We only *know* the motives which govern our own actions; but we infer by analogy that others act from similar motives. Knowing that we ourselves combine means designed to effect ends—when we see others adapting means to ends, we assume that they act also with design. Hence we have a right to extend the argument further and higher.

The result of what I have said is this: The phenomena of the universe can not be satisfactorily explained unless by the study both of efficient causes and of final causes. Routine scientists, confining themselves to the one, and routine theologians, confining themselves to the other, may suppose them to be in conflict. But men of larger insight, like Leibnitz, Newton, Descartes, and Bacon, easily see the harmony between them. Like Hegel they say: "Nature is no less artful than powerful; it attains its end while it allows all things to act according to their constitution"; or they declare with Bacon that "the highest link of Nature's chain is fastened to the foot of Jupiter's chair." But the belief in final causes does not imply belief in supernatural intervention, nor of any disturbance in the continuity of natural processes. It means that Nature is pervaded by an intelligent presence; that mind is above and around matter; that mechanical laws are themselves a manifestation of some providing wisdom, and that when we say Nature we also say God.*

JAMES FREEMAN CLARKE.

* In this brief paper it is not possible even to allude to the objections which have been brought against the doctrine of final causes. For these objections, and the answers to them, I would refer the reader to the work of Janet, before mentioned.

DR. McCOSH.

WHATELY describes the "Fallacy of Interrogation" as consisting "in asking several questions which appear to be but one; so that whatever one answer is given, being, of course, applicable to one only of the implied, may be interpreted as applied to the other." Professor Newcomb has unconsciously fallen into this fallacy. He evidently looks on the questions he puts as one, and speaks of his "postulate," his "position," his "fundamental proposition." But he has mixed up no fewer than three questions, which are not the same, with each other, which have no necessary connection, and are not to be satisfied with one reply. In such cases, logicians enjoin that, in order to detect the ambiguity, each question be answered separately. Thus, if some one were to ask me, "Did you write such an article, without a meaning, and was this wise?" I might have to reply that I did write the article, with a meaning, and that this was wise. The Professor has in fact three questions: (1.) "The whole course of Nature considered as a succession of phenomena is conditioned solely by causes." This is not the same as (2.) "In the action of which causes no regard to consequences is either traceable by human investigation or necessary to foresee the phenomena." (3.) "Is the above postulate consistent with sound doctrine?"

I answer the *first* question affirmatively, only I do not favor the terribly metaphysical word "conditioned" used by scientists in the present day so constantly and so vaguely. With me as with Mill, a physical condition is merely one of the elements of a complex cause. The Professor evidently sets before him a scowling theologian who will not allow him to find out a physical cause of the phenomena of Nature. I admit without reservation that in the Course of Nature every occurrence proceeds from an antecedent cause. "This is a principle founded on a limited series of observations and extended by induction to the whole course of Nature." I am not required here to take up the subject of miracles—say the miracles of healing wrought by our Lord to show that he came to cure the evil in our world. A miracle I define as an event produced by causes not in Nature but beyond it. Miracles are acknowledged by all to be comparatively few and exceptional, and they accomplish their end because they are so. Leaving out miracles, and creation, which belongs to the same order, I hold that in the course of Nature every occurrence is produced by antecedent causes.

I do not very well know what he means by the *third* question,

that his postulate is consistent with "sound doctrine," a phrase which he acknowledges to be "vague." If he means by it simply "truth," then I hold as to whatever is established by induction, not that it is consistent with, but that *it is* sound doctrine. If he means by it religious doctrine, we might have to begin with settling what is sound doctrine. I hold very emphatically that truths of science are to be determined solely by inductive evidence. I believe that in the end no truth of science will be found inconsistent with the truths of religion. They may appear to be so, but this only because we have misinterpreted Nature or misinterpreted Scripture. The ground is now cleared. I admit the *first* question. The *third* is somewhat out of place. But I admit it if the *second* is properly answered. It is sound doctrine in science and in nearly all religions that God is traceable in his works.

The *second* question is the only one in dispute between us. "In the action of Nature, is there no regard to consequences traceable by human investigation, or necessary to foresee the consequences?" Again we have two questions under the appearance of one. But the two are connected and may be answered together. The inquiry is a very important one. It is not exactly, "Is there a God?" but it is "whether his existence is shown by his works." He who asserts that there is no regard to consequences traceable in mundane action is setting aside that argument for the Divine existence which the Scriptures sanction (Ps. xix. 1, Rom. i. 20), and which the great body of mankind have acknowledged to be valid.

Of course I allow that physical causes do not in themselves have any regard for consequences, and that they do not foresee phenomena. The chemical elements are as ready to combine to produce poison as to produce food, and they do not know or feel the pain or pleasure resulting from their action. I do not believe, with pantheists, that intention and end are immanent in Nature. But, discovering these in the dispositions and adaptations of agents, I argue a cause above them, with a plan and purpose. The title of his paper is "Law and Design." He evidently regards "Law" and "Design" as inconsistent with each other, as opponents and rivals. In opposition, I hold that—

I. *There is design in law.* The word law as applied to physical phenomena is vague. Nature in its ultimate analysis seems to consist of bodies with their properties. These bodies are supposed to consist of atoms, and these combined make masses. Do we know the ultimate properties of bodies molecular or molar? All

bodies fall under our notice in masses, and the properties are in combination. In their combination they act in an orderly manner; and this seems to be what is meant by law. They are called by such names as laws of phenomena, general laws, coördinations, and appear as uniformities, types, periodicities. They are all composite, and are the result of a number of properties adjusted to each other. Such are the seasons, the forms of plants and animals, the evolution of children from parents, and, it may be, of one variety or species of plant or animal from another. Their regularity implies a plan, and consequently design. In particular they are suited to man—or, if any prefer it, man is suited to them; or, as I prefer it, the two are suited to each other. Some people unreasonably complain that things should proceed according to regular laws; as, for instance, that fire should always burn, and would rather that God should make them act according to circumstances, and interpose to stop fire from burning a poor man's house or a cathedral. But under such a Divine government no one could foresee the future or provide for it, could know that fire would prepare his food for eating, could have even a motive to partake of food, for he could not know whether food would nourish him.

There are cases in which we can see that there is law which enables us to "foresee" and "predict," and this not by tracing effects to causes, but simply by discovering a preordained order. Professor Peirce tells that at a meeting of a scientific association Agassiz was asked to draw the form of a fish, such as must be in a certain period were one to cast up, and that he went to the board and drew the form. Professor Sedgwick, who was present, now took off a napkin and showed fishes of that very epoch, and the form was found to be the same. Here we have a prediction, not by the law of causality—for the same causes differently disposed might have produced a very different form—but by the law of teleology, or rather homology, implying a plan devised by intelligence.

II. *There is design in the adaptation of one object and agent to another*, whereby special ends are accomplished. It is not needful that I should dwell on these. We have them in Paley, in the Bridgewater Treatises, in the works of Sir C. Bell, Brougham, and many others, accessible to all. We see them in every organ of the body, in the joints, the muscles, the eye, the ear, the hand; and on the discovery of them every one spontaneously looks for a cause in a designing mind—we feel that we have to abnegate our intelli-

gence if we do not yield to the conviction. An eminent French philosopher, M. Janet, in a work on "Final Causes," lately translated, has defended the arguments and answered objections. There is no antithesis, as the Professor seems to think there is, between efficient and final cause. Aristotle, who introduced the phrases, discovered both, as did also Bacon, and the profoundest thinkers of ancient and modern times. I presume that the Professor sees both the efficient and final in his own telescope: the former in the undulations of light and the glass suited to each other; and the latter in the causes being made to serve an end. The argument is *a fortiori* when we discover the efficient causes in the light, the coats and humors and cones made to form an image on the back of the eye.

The argument is from the evidently designed concurrence of natural causes. Chance, in its largest sense, is an event (1) without a cause, or (2) without a purpose. The scientific philosopher knows that there is no physical occurrence without a cause. The religious philosopher believes that there is no event without a purpose. Is there, then, no such thing as chance? I believe that there is no event without a cause and a purpose too. But there may be *coincidences* of events in which there is no design. I do not know that there must be design when, in a promiscuous company, half the people have the same Christian name, in the resemblance of certain rocks to the head of Bonaparte, or in so many eminent men having been born in 1769. But surely where there is room for chance there may be room for design; where there is room for undesigned coincidences there may be room for designed concurrences. When I notice a combination of independent agencies to effect a beneficent end, such as the eye, the ear, the hand, I see clear traces of a purpose. I place under the same head the provisions which have been made beforehand, and from the beginning, for the encouraging of virtue, for the restraining of evil, for hastening on the cause of religion and humanity, for answering prayer, and for relieving distress.

Professor Newcomb puts the case of the burning of a theatre, and supposes that, on inquiring into its meaning, three answers might be given. I do not accept his answers, and I propound three others, wishing my readers to compare his with mine: 1. The occurrence was produced by causes which we should inquire into, and which we may or may not be able to discover. 2. These causes were set agoing by God, and have fulfilled his purpose. 3. We may or may not be able to find out the purpose. In all cases reli-

gion, by its highest authority, forbids us to argue the existence of wickedness because the persons have suffered. "Suppose ye that these Galileans were sinners above all the Galileans because they suffered such things? I tell you nay." This does not preclude us, when the wickedness has been proved, from discovering an intended connection between the sin and its punishment. I can believe both in a physical agency and a moral purpose.

I may remark here that there seems, among some of our scientists in the present day, to be a derangement of mental vision produced by their gazing exclusively on some one object. God has given to every man two eyes; and there are benefits derived from binocular vision—it enables us, as the Irishman said, to look round a corner, and see more than one side of an object. But by looking so long through a microscope some seem to have become one-eyed. There is no good end to be gained by setting the two schools to which the Professor refers, the scientific and the theological, against each other. The business of the physicist may be simply to discover mechanical force, and of the physiologist to trace the processes of life, and of the psychologist to discover the faculties of the mind. The business of the theologian is to discover the operations of God. He is a *narrow* man who in inquiring into Nature can discover only mechanical force—while he overlooks vital and psychical agencies. He is also a narrow man who on finding these efficient causes overlooks that evidently designed concurrence of efficient causes which constitutes final cause. On the other hand, the religious man is so far a narrow man who will not allow scientists to discover physical cause. The truly enlightened man will delight to discover both, and will see no inconsistency between them. In particular, while seeing efficient causes manifesting the power of God, he also discovers benignant ends exhibiting the wisdom and goodness of God.

JAMES MCCOSH.

NOTE.—A rejoinder by Professor Newcomb will appear in the next issue of the "Review."—EDITOR.

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